MACWORLD

The Macintosh[®] Magazine

April 1989 \$3.95

New! Mac IIcx

In-Depth

Coverage of Apple's New Mac

PageMaker, Quark Xpress & ReadySetGo: How They Compare

Statistics Software

Music for Beginners

Moving PC Files to the Mac

Ten Techniques for Speed



True Macintosh Microsoft acro

Editor's Corner

By B. R. Ross

Fasten your seatbelts, Mac*fans. You're about to enter the Microsoft Zone.

Earlier this week I witnessed a demo of Microsoft's products that left me feeling as enlightened as the day I first set my eyes on a Macintosh.

Here's a company with a reputation for singularly superior products. But what they showed me pushed the envelope of software productivity:

A complete line of products for the Mac that all work together.

The significance of which hit me like a ton of bricks when I saw them in action.

For instance, I saw a chart in your very favorite spreadsheet and mine, Microsoft Excel, updated from within Microsoft

Word 4.0 using just a few keystrokes. And then pasted into PowerPoint® for an incredible looking presentation.

And with just as little effort, the evercapable Microsoft Word 4.0 was merged with Microsoft's database application, File, for a mass mailing.

As if that wasn't enough, I saw their versatile integrated program Works share files with Microsoft Excel and Word.

What really blew me away is Micro-

soft Mail. You can send and receive information between members in your workgroup even if they're on a PC. Nice.

But the real beauty is that you can access Microsoft Mail directly from the File menu when you're in Microsoft Word 4.0. No other company can offer that kind of integration. Or this kind:

A product line that all works together.

With other applications on the Mac. And even with such PC standards like Lotus[®] 1-2-3[®], Microsoft Word 5.0 and WordPerfect[®].

What's more, every product is supported by on-line help and a comprehensive manual. Or you can call one number for unlimited technical support.

Obviously, I'm impressed. So much so, that I've asked Microsoft to send copies of their Macintosh product line brochure in time for our next meeting. If you can't make it, you can always get a free copy by calling (800) 541-1261, Dept. 192.

Fellow Macphiles, man your Macs. Because we're entering a new age of compatibility—or at least Microsoft is.

And I don't know about you, but I plan on going along for the ride.

Here's a company with a reputation for singularly superior products. But what they showed me pushed the envelope of software productivity: A complete line of products that all work together.

WEST SIDE USERS GROUP



13

IS NOW YOUR



- 9" × 9" × 3" Padded Pocket for External Disk Drive, Modem, or Accessories.
- 2. Padded Compartment for Mouse and Cords.
- Padded Compartment fits ANY Extended Keyboard.
- Padded Flap separates Hard Disk from Computer.
- ½" High Density Foam for Maximum Protection.
- Navy Blue, Platinum Grey, Jet Black or Burgundy Cordura[™] Nylon Outer Shell
- 7. Heavy Duty Metal Hardware Throughout.
- Stress Points Cross and Box Stitched for Added Support.
- Padded Handle for Comfort, features Velcro Enclosure.
- 10. 2" Stiff Nylon Webbing Maintains Shape.
- 11. Shoulder Strap with Slip Stop Pad.
- 12. Outer Handle to Assist in Shoulder Carrying.

13. LIFETIME WARRANTY



Circle 385 on reader service card

P.O. Box 156 • EXTON • PA • 19341

MACWORLD

Editor-in-Chief

Jerry Borrell

Executive Editor: David Ushijima Managing Editor: Charles Barrett Senior Editor: Adrian Mello Editorial Manager: Jane Lagas Associate Editors: Deborah Branscum, Joe Matazzoni, Tom Moran, Carol Person, Cheryl Spencer, Suzanne Stefanac East Coast Editor: Brita Meng Senior Production Editor: Luis A. Camus Senior Copy Editor: Ruth Henrich Assistant Editors: Cathy E. Abes, Mark Hurlow, Mary Margaret Lewis, Liza Weiman Production Editor: Annie Jenkel Copy Editors: Emily Bower, William Freais, Felicity O'Meara, Katherine L. Ulrich, O'Brien Young Assistant Production Editor: Barbara Tannenbaum Editorial Assistants: Pamela T. Creighton, Ann Garrison Editorial Administrative Assistants: Lyn Taylor, Joyce C. Ripp Assistant to the Editor-in-Chief: Lisa Barshay Contributing Editors: Nancy E. Dunn, Robert C. Eckhardt, Erfert Fenton, Danny Goodman, Rob Hahn, Jim Heid, Dave Kosiur, Steven Levy, Lon Poole, Charles Seiter, Franklin Tessler, Bruce F. Webster

Art and Design

Art Director: Christopher Burg Designer: Dennis McLeod Associate Art Director: Joanne Hoffman Senior Design Associate: Leslie Barton Design Associate: Hae Yuon Kim

James E. Martin

President and Publisher Macworld Communications Steven J. Rosenfield Associate Publisher

Production

Senior Production Manager: Anne Foley Assistant Production Manager: Claudia Dawn Smukler Advertising Billing Coordinator: So Fong Yip

Marketing and Advertising Sales

Director of Advertising Sales:
Patricia Navone (415/243-0505)
Senior Account Manager/No. California
(San Francisco): Penny Rigby (415/243-0505)
No. California (San Jose): Cherie La France
(415/243-0505)

Northwest: Regina T. Salaices (415/243-0505) Midwest: Shannon Dolan (312/827-4477) Southeast: Kathy Isaacs (404/394-0758) New England: Joan Flynn (508/879-0700) Eastern Advertising Manager: Bill Thompson (201/967/1350)

Mid-Atlantic: Annette Bremer (201/967-1350) So. California, Southwest, Texas: Paul Dudas, Cathi Tucker (714/250-1307) Macworld Catalog: Carol Felde, Niki Stranz Director of Marketing Services: Sandi Vargas

Circulation

Circulation Director: Daniel Orum Circulation Manager: Lindsay Davidson Fulfillment Coordinator: Evelyn Adenau Promotion Coordinator: Lori Hitchcock Circulation Assistant: Catherine Huchting Single-Copy Sales Director: George Clark Single-Copy Sales Rep: Martin Garchar

Research

Director: Cheryl Woodard
Manager: Ralph Ames
Market Analyst: Dusty Roady Pedersen
Research Assistants: Bill Segovia, Scott Shores

April 1989

Volume 6, Number 4

Macworld* (ISSN 0741-8647) is published monthly by Macworld Communications, 501 Second St., San Francisco, CA 94107. Subscription rates are \$30 for 12 issues, \$60 for 24 issues, and \$90 for 36 issues. Foreign orders must be prepaid in U.S. funds with additional postage. Add \$16 per year from Canada and Mexico; add \$16 per year for surface mail or \$95 per year for airmail from all other countries. Second-class postage paid at San Francisco. POSTMASTER: Send address changes to Macworld, P.O. Box 54529, Boulder, CO 80323-4529. For dealer inquiries call 800/621-5461, in California 800/521-8455. Editorial and business offices: 501 Second St., San Francisco, CA 94107, 415/243-0505.
For subscriber services call toll-free 800/525-0643 (in Colorado 303/447-9330) or write: Subscriber Services, P.O. Box 54529, Boulder, CO 80322-4529.

Macworld is a publication of Macworld Communications. Macworld is an independent journal not affiliated with Apple Computer, Inc. APPLE, the APPLE LOGO, MAC, MACINTOSH, and MACWORLD are registered trademarks, and MACLETTER is a trademark of Apple Computer, Inc. Printed in the United States of America. Copyright ⊚ 1989 Macworld Communications. All rights reserved. Macworld is a member of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 80 computer publications in more than 28 major countries. Fourteen million people read one or more IDG Communications publications publications each month.



The \$19.32 Modem.

Now everyone on even the biggest Macintosh network can have the power of modem communication for less per Mac than the cost of a box of floppy disks. Because the Hayes®-compatible NetModem™ V2400 can be shared, just like you share a LaserWriter® So there's no need for the cost or complexity of multiple modems and phone lines. The NetModem V2400 is easy to set up − just plug it in and turn it on. And it's easy to use. You can hear the progress of your call, no matter where in your office the NetModem is, because it feeds familiar modem sounds back to your own Mac's

speaker. It also displays a modern front-panel icon, with 'LED' status lights, in your Mac's menu bar.

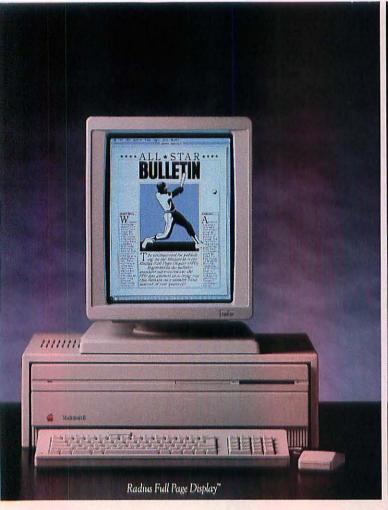
If you're away from the office, you can call in through any ordinary modem and the NetModem V2400 connects you to the office network. You can access files, use TOPS, AppleShare, electronic mail, printers or any other network resource, just as if you were sitting in front of your office Mac. Find out how the NetModem V2400 can make your Macintosh network more productive. Call 1-800-458-3550, or write Shiva, 155 Second Street, Cambridge, MA 02141.

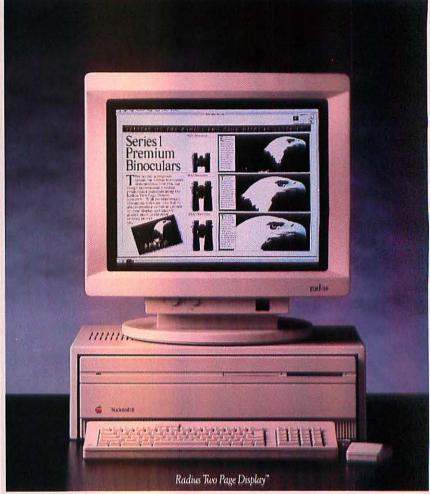
Net Modem by Shiva

We're Putting Networks To Work™

OK, we admixt you can't buy a KesModern for \$19.32. But if you divide the NesModern's \$599 list price by \$1 Macs on an AppleTalk network - the nominal limit - the cost per Mar's \$19.32. Still the best deal around.
Trademarks: NesModern - Shira Corporation, Registered Trademarks: Hayes - Hayes Microcomputer Products, Inc.; Lister@riter.AppleShare - Apple Computer, Inc.; Tops - Sun Microcoystems, Inc.

Circle 421 on reader service card





FOURCLEAR YOU SHOULD BUYYOU A RADIUS AUTH(

Now you can buy your Macintosh II with a powerful tool which will dramatically increase your productivity with every use.

A Radius Display.

Radius offers displays for every type of Macintosh user and every Macintosh software application.

If you're involved primarily in intensive word processing and database management, we heartily recommend our FPD.

The Radius Full Page Display™ shows you an entire 8½"x 11" paper-like page. With a refresh rate of 69 Hz, it is virtually flicker-free.

Our display is perfectly suited for working with software like Microsoft Word and 4th Dimension.

If you're incorporating your word processing into page layout and design, we suggest that the Radius Two Page Display™is clearly the choice for you.

You have the same flicker-free resolution of the FPD with a full two-page horizontal layout. Ideal for viewing a magazine spread. Essential for creating architectural plans.

Or, if you're putting photographs into your Macintosh, our Radius Gray Scale Display lets you create and manipulate life-like images in 256 shades of gray across the same expansive TPD.

Scan your photographs, then do your own retouching using Image Studio or Digital Darkroom.

When you're ready, just print out on a LaserWriter or download to a Linotronic. You'll get startlingly beautiful and gratifying results.





EASONS WHY URMACINTOSH IIA ORIZED DEALER Our Full Page Displays allow you

For professional publishers and engineering designers, the Radius Color Display™offers you the latest in digital design, Radius innovation and Trinitron color technology.

You can work with 256 brilliant colors at one time from the Macintosh palette of 16.7 million hues.

Create color layouts with Quark XPress. Draw dynamic 3D illustrations. Design a new circuit board. Or, simplify a complicated catalogue. All in vivid, living color. And should you need it, our Color Display is more than willing to work instantly in gray scale. With sharp, crystal clear resolution.

Best of all, no matter which Radius display you do choose, you get the classic Radius firmware.

All of our displays offer you Tear-off Menus which can be positioned anywhere on the screen. And built-in screen savers, control panel access, as well as adjustable menu and menu bar type size.

Our Full Page and Two Page
Displays allow you to create bitmap screen dumps. And our Gray
Scale and Color Displays let you save
any part of your screen in a PICT file.

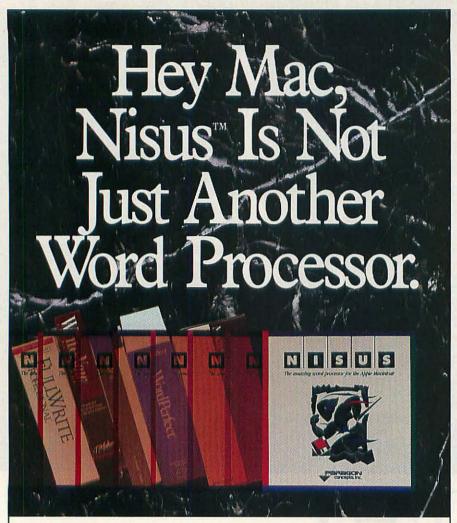
So before you buy your Macintosh II anywhere else, call 1-800-527-1950 ext. 84 for a brochure and the name of your nearest Radius Authorized Dealer.

It's clearly the thing to do.



Circle 46 on reader service card

Color image courtesy of Scitex Corporation, Ltd. and Quark Inc. All other brand and product names are trademarks or registered trademarks of their respective holders



Here's why.

Want to draw a picture without ever leaving the program? Easy. Want to wrap text all the way around it or let the text flow right

through? Easy.

Want to see it all in glorious color? Easy.

Need to find a particular word or phrase by searching through all files, open or not? Easy.

Need to use our superior dictionary or thesaurus? Easy.

Want to undo what you just did, or any number of things you did before? Unlimited Undos. Easy. Want to use the fastest word processor on the market? Easy. Line numbers? Envelopes? Autosave? Column selection? Adjusta-

> ble page preview? Ten clipboards that can be edited and printed? Your favorite page layout ready when you open a new file?

It's all easy when you have Nisus. Ask your favorite





Nisus is a trademark of Paragon Concepts, Inc.

(619) 481-1477 Outside CA (800) 922-2993 4954 Sun Valley Rd., Del Mar, CA 92014

Circle 253 on reader service card

Corporate

PCW Communications, Inc.

Axel Leblois

Chairman/Chief Executive Officer

Lee Vidmer

President

James E. Martin

Vice President

John Griffin

Vice President

Cheryl Woodard

Vice President

David Bunnell

Founder

Andrew Fluegelman

1943-1985 Founding Editor

Administration

Director of Finance: Vicki Peilen Corporate Business Manager: Christina W. Spence Accounting Manager: Pat Murphy Administrative Services Manager: Joseph Wollenweber Employee Relations Manager: Shelly Ginenthal Technical Services Manager: Wally Clegg Assistant to the President (Macworld Communications): Susan Miller Assistant to the Associate Publisher (Macworld Magazine): Cynthia J. Meade







SYMANTEC UTILITIES PROTECTS SMART PEOPLE AGAINST HARD DISK CRASHES THE SAME WAY AIR BAGS PROTECT DUMMIES.

'SUM, or to be more precise, Symantec Utilities for Macintosh, is the slickest and most important set of utilities you can get for your Mac. To have a hard disk and not have SUM is sheer folly.

Steven Bobker, Chief Scientist, MacUser Magazine, 9/88, 5 Mice, Highest Possible Rating

Strong language. But well founded. Because in addition to six other indispensable utilities, SUM features Guardian, the ultimate software for protecting your

SEVEN INDISPENSABLE HARD DISK UTILITIES:

Guardian—protects and restores hard disk data and deleted files. Disk Clinic™-easy-to-use troubleshooting interface. Restores hard disk data in case you have a crash before you can install Guardian. Virus Protection—protects systems against "viruses." HD TimeUp — optimizes hard disks. Symantec Tools—views and edits data and resource forks of a file or volume in HEX or ASCII. QuickCopy "—makes fast floppy copies. HD Partitionseparates hard disks into separate volumes which can be encrypted.

Mac's hard disk before a crash. Like an air bag, Guardian stays out of sight, loading automatically every time you turn on your Mac. It protects invisibly by updating a "map" of your hard disk data. So that, in a crash, your data is safe. Because Guardian uses the "map" to locate it and recover it. In minutes.

Smart Mac users who want complete, yet effortless protection for their hard disk data should follow Steven Bobker's advice and "Get SUM." Today. See your dealer or order

today: (800) 228-4122 Ext. 675G

Bundled exclusively on all Jasmine Hard Disk Drives.



SYMANTEC Symantec Corporation, 10201 Torre Avenue, Cupertino, CA 95014. 408/253-9600.

MacZap owners call 408/446-9994 for a low cost upgrade. HD TuneUp, QuickCopp, and Disk Clinic are all trademarks of Symantec Corporation. O

arks of Symantec Corporation. Other products are trademarks of their respective holders. © 1988 Symantec Corporation

The essential Macintosh word processor.



Like its phenomenally successful predecessor, MacWrite II is uncomplicated, graphic and easy to understand.

Now has all the essentials.



MacWrite II turns your writing into publishing. With up to ten columns, adjustable line spacing and the ability to crop and scale graphics.

MacWrite II gives you font control you must see to believe (2 to 500 points). Plus footnotes that number themselves.

Mail merge makes it simple to send one personal letter to a million close friends. And create custom stationery templates to use over and over



The only thing more impressive than our new HyperCard-style Claris Help feature is how seldom you'll need to use it.



Keep more than one document open. Edit and preview your pages before you print them. And import color graphics.



Add frequently used styles to your menus and turn them on and off with keyboard commands.



An amazingly fast 100,000-word dictionary checks and corrects your spelling in a flash. MacWrite II includes a desk-accessory thesaurus, too.



A good leader must be a good communicator So MacWrite II reads and writes directly to all these word processing formats.

Introducing MacWrite II. CLARIS



WHEN YOU'RE MORE PRODUCTIVE, IT SHOWS.

MORE II: PLANNING, WRITING AND DESKTOP PRESENTATIONS.

Being MORE productive means everything you plan, write, or present is MORE organized. And it shows in everything you do.
MORE II's advanced outlining makes it

easy to capture, plan, and organize ideas into



Outlines make MORE II the mouse on any part of an outline and get charts and slides, instantly. clear, action-oriented information. Simply type in "To-Do" lists, project schedules. proposals, plans... everything. MORE II automatically creates the outline for you.

Show slides in

complete with

wowing video

effects.

35mm, or present them live on-screen,



Customize presentations with MORE II's complete set of drawing tools.

THE OUTLINE MAKES THE SHOW.

Once you have an outline. your art work is done. Because with a double-click of the mouse, any outline becomes a perfectly spaced bullet or organization-type chart instantly. Complete with company logos or art pulled in from other programs. Print the charts and get overheads

fast. Or turn them into 35mm slides overnight. For even more graphics, click again and get every art tool imaginable. And because of MORE II's outline, when you change the master slide, the rest change automatically. So making 1000 slides is as easy as making one.

Click on another outline, add a few paragraphs using MORÉ II's full-power word processing and bingo. You've got a memo. Or a

letter. Or a proposal. Add pages, pull in some charts and there's a full-scale report or a board-room quality presentation... totally spell-checked,

with text, graphics, fonts and styles to rival anything created on any

other program.



Write beautifully with MORE II's complete word

Now go live. MORE II includes advanced, live-action meeting technology for slide shows (complete with video effects like dissolves, builds, wipes, and fades) on any MAC connected to virtually any projection device.

BE MORE PRODUCTIVE TODAY.

For planning, writing, and presentations, MORE II shows results. It's the only software that

helps you master all three stages in the art of persuasion. Without becoming an artist.

For MORE II product and upgrade* information, call (800) 228-4122 Ext. 747G.



WHEN YOU'RE MORE PRODUCTIVE, IT SHOWS™

SYMANTEC, Symantec Corporation, 10201 Torre Avenue, Cupertino, CA 95014. 408/253-9600.

**MORE awters, ubgrade to MORE II nou, send \$89 plus \$10 for shipping/handling (check or money order) along with your MORE registration number to MORE II upgrade, Symantec Corporation, 10201 Torre Avenue, Cupertino, CA 95014 or call 415364-445. Suggested retail price \$395. MORE and MORE II are trademarks of Symantec Corporation.

§ 1898 Symantec Corporation.

Circle 215 on reader service card

Mac Bulletin

HP PaintJet for the Mac

Hewlett-Packard now offers an interface kit to make Mac Pluses, SEs, and IIs work with the HP PaintJet color graphics printer. The kit lets the printer run with QuickDraw-based Mac software, including MacDraw II, Microsoft Word 3.02, Excel 1.5, PowerPoint, and Cricket Presents.

With the kit, the HP Paint-Jet printer supports 256 colors on the Mac II and 8 colors on the Mac SE and Plus. Depending on the software, users can mix colors to get thousands of shades and bues.

The HP PaintJet printer produces 180 dots-per-inch and prints near-letter-quality text at 167 characters per second. A typical page prints in 30 to 40 seconds. The kit provides bit-mapped printer fonts in sizes from 10-point to 36-point and in Times, Helvetica, Courier, and Symbol fonts. For further information, contact Hewlett-Packard Peripherals Group at 619/592-4676.

Crate Hard Drives

Crate Technology is manufacturing eight new hard drives, including Tote-Crate, a removable drive for Macintosh users who work with classified or sensitive data. ToteCrate features a 45MB removable data cartridge. The other seven drives are a 40MB Inner-Crate internal disk drive for the Mac SE; 100MB and

160MB InnerCrate internal disk drives; 100MB and 160MB MacCrate external disk drives for the SE and the II; and upgraded 300MB and 600MB InnerCrate internal disk drives for the II. Crate drives are sold through distributors and dealers and directly to government offices, educational institutions, and the Fortune 500. For further information, contact Crate Technology at 213/822-4669.

New Printing Options

Laser Connection, a QMS subsidiary, is offering three new printing products. First is the new version of MacJet software, which lets Macintosh users print directly to all HP LaserJet series, and compatible, printers. It works with the 512K Mac and up, and it lists for \$249.

Second is the SX Envelope Cassette Tray, an automatic-feed tray that holds up to 15 envelopes and fits into the paper cassette slot of all Canon SX-based printers, including QMS Kissplus, QMS-PS 810, HP LaserJet Series II, and Apple LaserWriter II printers. It lists for \$85.

Third is the BigBin 1000, a motorized paper input tray that lets Apple LaserWriter IISC, NT, and NTX printers hold 1000 sheets of letter-size paper, five times more than the standard paper cassette. The company also has versions for Canon SX–, Ricoh 4150–, and Ricoh

4080/4081-based laser printers. All BigBin 1000 versions list for \$795. For further information, contact Laser Connection at 205/633-7223.

Virex Update

HJC Software has updated Virex, its antivirus program for the Mac, to combat two new viruses reported by Virex users. The first is an entirely new and different Mac virus that infects disks the instant they are inserted into an infected computer. It infects programs by inserting INIT 29 resources, so it has been named the INIT29 virus.

The second virus is a derivative of the nVIR family of viruses, with two minor variations that help it escape detection by previous antivirus software. It is called the Hpat virus because it replaces nVIR resources with Hpat resources.

Virex lists for \$99.95. Registered users will be notified and offered an update for \$15. For further information, contact HJC Software at 919/490-1277.

84MB Drive from PCPC

Personal Computer Peripherals Corporation (PCPC) has announced an addition to its line of MacBottom SCSI hard disks for the Mac Plus, SE, and II. The new MacBottom HD84 offers a formatted storage capacity of 84MB. The new drive combines a 19-millisecond average ac-

cess time, an interleaf ratio of 1:1, and a track cache. The track cache tries to calculate what the next request for data will be and stores that data in memory on the drive's controller board.

The HD84 comes fully formatted and includes PCPC's popular HFS Backup 3.0 and other disk utilities. An internal, Hayes-compatible 300/1200-baud modem is optional. For further information, contact PCPC at 813/884-3092.

In-CAD

Infinite Graphics has been hard at work on its In-Vision family of advanced CAD/CAM software for the Mac. In-CAD, the first package available, provides both 3-D solids modeling and 2-D drafting capabilities. Traditionally, these two functions are sold as individual programs and often don't even share the same user interface.

In-CAD contains a true Constructive Solid Geometry (CSG)—based modeling program and thus provides a more complete object model than can be achieved with wire-frame or surface modelers. Building-block primitives and Boolean operations are used to add and subtract material, and the resulting model may be viewed from any direction with hidden lines removed, shaded, or sectioned.

(continues)

In-CAD also has a translator specifically for AutoCAD DXF files, full geometry creation and editing, a user programming language, a WYSIWYG interface, and an IGES translator for importing and exporting files between other CAD systems.

In-CAD operates on the Mac II only and lists for \$1945. For further information, contact Infinite Graphics at 612/721-6283.

Hot Presentations

General Parametrics Corporation, a leader in desktop presentation products for the IBM PC, has entered the Mac market with three models of its Video-Show Desktop Presentation System. Each model produces and shows slides, transparencies, overheads, and handouts. The portable presentation units can be connected to any color monitor or large screen video projector. You operate them with wireless, hand-held remote-control units and choose between a broad spectrum of special effects such as fades, wipes, spirals, weaves, and an on-screen pointer.

The top of the VideoShow line is the VideoShow Professional, retailing for \$8995. The VideoShow Executive retails for \$2695 and the VideoShow Companion for \$1795. For further information, contact General Parametrics at 415/524-3950.

Apple Lowers SE/30 Prices

Apple has reduced its SE/30 prices and has changed the system's configurations, in part due to the unpopularity of last fall's price hikes. Now at the lowend is the SE/30 with 1MB of RAM and an FDHD floppy drive for \$4500. The low-end hard disk configuration includes 1MB of RAM, an internal 40MB hard disk, an FDHD, and a keyboard, all for \$5000. At the high end, you get 4MB of RAM, an internal 80MB hard disk, and an FDHD for \$6500 to \$6700. For further information, contact Apple Computer at 415/996-1010.

NEC's Printer

NEC Information Systems has introduced the Silentwriter LC 890XL Post-Script page printer, featuring the new 68020-based Atlas controller from Adobe Systems. The printer comes with 4MB of RAM that is expandable to 8MB, and offers an external 20MB hard disk option. The 20MB disk lets users cache large numbers of fonts and overlays.

The LC 890XL uses LEDarray technology and has a rated print speed of 8 pagesper-minute. It includes 35 resident typefonts and accepts downloadable fonts from Adobe. Other features include emulation of HP LaserJet II series and Diablo 630 ECS; Centronics parallel, RS-232C serial, and RS-422 AppleTalk interfaces; and two 250-sheet input hoppers.

The LC 890XL lists for \$6995. The optional 20MB hard disk costs \$999. The printer was scheduled to ship in March. For more information, contact NEC Information Systems at 508/264-8000.

MacDot Printer

Advanced Matrix Technology (AMT) has introduced the MacDot printer to compete with the Apple Image-Writer LO and ImageWriter II printers. The first 24-wire printer for the Macintosh, MacDot prints draft-quality pages at 480 characters per second, provides a variety of graphics resolutions, and prints text from 5 to 20 pitch. Text attributes include bold, shadow, italics, underline, proportional, and supersubscript. Fonts include Courier, Gothic, Trend, and Elite.

MacDot prints both text and graphics in either black and white or full color. For further information, contact AMT at 800/992-2264.

Sony, Pinnacle Ship Erasable Optical Drives

Considered to represent a new generation in storage, magneto-optical disk technology (the storage technology used in the Canon drive announced for Steve Jobs's Next computer) has arrived for the Macintosh. Sony Corporation says it has begun shipping magneto-optical drives to Pinnacle Micro of Irvine, California, which is incorporating them in its recently introduced 650MB removable, erasable disk system, the REO-650. The erasable optical drive attaches to the Mac's SCSI port. Removable 650MB disks cost \$230 each; the REO-650 lists for \$5995. Pinnacle will also offer a twodrive unit, the REO-1350. For more information, call Pinnacle at 714/727-3300.

Network Server from Jasmine

Jasmine Technologies has rolled out DirectServe, a combination of software and external hardware that provides faster, cheaper AppleShare networking than setups based on a dedicated Macintosh. DirectServe is built around a 68000 chip, includes Apple-Share code in ROM, and comes with 1MB of RAM (expandable to 4MB). Data caching increases Direct-Serve's performance. Network cost per node is projected to be about half that of a traditional AppleShare network. DirectServe, slated to ship in February, will cost \$1299. For more information, call Jasmine at 415/282-1111.

New WriteNow Now

 T/Maker is shipping WriteNow version 2.0, which includes over 50 new features, including three dictionaries (large, small, and user-created), character/word/paragraph count, smart quotes, mail merge, and direct importing and exporting of RTF (rich text format) and MacWrite files. WriteNow 2.0 is now compatible with MultiFinder, the Apple Extended Keyboard, AppleShare, TOPS, and other networking systems. It comes on two 800K disks; one disk is optimized for use on singlefloppy-drive systems.

WriteNow 2.0 has a list price of \$195; registered owners who bought version 1.0 after January 15, 1988, will receive the upgrade free. For more information, contact T/Maker at 415/962-0195.

"Two or three years from now, the typical laser printer will be a lot like the Business LaserPrinter™: small, light, with a SCSI connector for a hard disk. and inexpensive."

That's how Publish! magazine characterized our Business LaserPrinter

THE FUTURE OF POSTSCRIP

(BLP), a Postscript® printer for Macintoshes, IBM's and IBM clones. We'd only add that the future has arrived ahead of schedule.

Simply stated, the BLP is a better way to translate the language called Postscript into the graphics. words and numbers people use to communicate in business.

Better because the BLP lets you—oranyone else on your Apple-Talk® network—produce superior text with the aid of 39 fonts (four more than our nearest competitor).

Better because the BLP comes with expandable RAM (two megabytes expandable to four), which lets you increase print speed. And because it has a SCSI port, which lets desktop publishers extend the font storage capacity of the BLP via a hard disk.

Finally, the BLP even takes better care of your bottom line. In fact, you can buy a BLP and a dedicated hard disk for less than the price of a LaserWriter® II NT alone.

Someday, if Publish! magazine is right, other printers will offer all this. But if you prefer not to wait, just visit your authorized GCC Technologies dealer for a BLP demonstration. For more information, or the name of a dealer near you, phone (617) 890-0880.*

Peripherals With Vision

*In Canada, (800) 263-1405.® 1989 GCC Technologies, Inc. GCC Technologies, Penpherals With Vision, Business LaserPrinter and the GCC Technologies logo are trademarks of GCC Technologies, Inc. All other product and





Classical.

SuperMac™has been making Macintosh*classics since 1985,

Like DataFrame™20, the first SCSI drive. Spectrum, the first color video card. The first large-screen displays for the Macintosh II. And PixelPaint, the first color paint program for the Mac*II.

Now there's a new generation of standards. Lasting investments that

help you and your Mac perform brilliantly. In whatever you do. In color or grayscale graphics. In true color. In mass storage. In business. Or in the arts.

Add SuperMac to your repertoire. And create some classics of your own.

Available now at authorized SuperMac dealers nationwide.





485 Potrero Avenue, Sunnyvale, CA 94086 (408) 245-2202

SuperMac, DataFrame and PixelPaint are tracemarks of SuperMac Technology, Macintesh and Macine registered trademarks of Apple Computer. In: Un domande in to Grande-Julie (1884-1886) by Georges Seurat Photograph courtesy of the Bettmann Archive. "Street copyright © 1988 Bert Monroy."

True color. The new wave for the Macintosh II. See it through the eyes of SuperMac."

The Spectrum/24 color graphics card lets you display nearly 800,000 colors on screen. From the 16.8 million. SuperMac monitors. Color. True color. colors available on the Mac*II. See every shade. Every detail. Everything. For exacting work where true color

is essential. For demanding professionals. In color pre-press. In animation. In video. In Computer Aided Publishing.

For the ultimate in display, The future. See it now. At authorized SuperMac dealers.





485 Potrero Avenue, Sunnyvale, CA 94086 (408) 245-2202

SuperMac and Spectrum/24 are trademarks of SuperMac Technology Macintosh and Mae are registered trademarks of Apple Computer, Inc. Guitars courtesy of Paul Gambon

Compare and see how easy choosing a hard drive can be.

"Superlative performance with exceptional utility software."

David Pogue, MacWorld writer

With so many hard drives available today, selecting the best one could be difficult. Luckily, Cirrus Drives from LaCie offer such an outstanding combination of speed, reliability and software power that your choice is quite simple.

But don't take our word for it — compare for yourself.

Compare the Value

CAPACITY	SPEED	PRICE
30mb	40ms	\$599 \$549
42mb	25ms	\$699 \$649
70mb	25ms	\$899 \$799
80mb	12ms	\$1049 \$999
100mb	25ms	\$1149 \$999
140mb	15ms	\$1499 \$1299
45R Removable Disk Drive	25ms	\$1199

Compare the Specs

We use superior 3-1/2" SCSI drive technology with access times as low as 12ms. Drives include 2 SCSI ports, easy SCSI address selection, terminators and quiet, efficient half-speed fan. Drives measure just about $3 \times 6 \times 9$ and weigh in at 4-1/2 lbs. Drives are available in our award winning external case shown here or in easily installed internal models for Mac SE and II.



CIRRUS DRIVES: Compare the Features

1000	Complete the "other" column to see if any other drive measures up.	CIRRUS
	■ Drives require no initialization to start-up.	
	■ Hardware and software auto-park feature.	
	Software maps out bad sectors on hard disk.	
	■ Share volumes over LocalTalk or modem.	
	■ Software supports hard and soft volumes.	
	■ Share most serial devices over LocalTalk.	
	■ Change volume size without reinitializing.	
	■ Create file volumes on a fragmented disk.	
	■ Software compacts & defragmentizes files.	
	■ Software includes read, write & seek tests.	
	Software selection of the interleave factor.	
	Password protect and write-lock volumes.	
	Link up to 7 drives into one large volume.	
	■ Volumes support UNIX and other systems.	
	■ Drive compatible with accelerated systems.	
	■ 6 SCSI driver choices for best performance.	
	Auto testing to determine best SCSI driver.	
	■ Drive won Industrial Design Review award.	
	■ 800 phone number for technical support.	
	Includes a 30 day money back guarantee.	

"Convenient size
is perfect.
Very fast,
reliable and
quiet. Software
is great...
my personal
choice."

Van Gray, President STF Technologies, Inc. Creators of FAX STF

Compare the Extras

We include a rugged
Cordura ™ carrying case, our Silverlining high performance hard disk
utilities and Silverserver software for
local and remote hard disk sharing.



We'll also throw in Silverplatter so you can share most serial devices on your LocalTalk network. In all a \$185 value — free.

So compare. You'll find there's really no comparison at all — just lots of great reasons to order your Cirrus drive today.

If you're still undecided, we'll even give you a 30 day money back guarantee so you can test drive a Cirrus for yourself.

Now what have you got to lose? Phone us today. Even the call is free:

1-800-999-0143

LaCie, Ltd. • 16285 SW 85th • No. 306 Tigard, OR 97224 • (503) 684-0143



Prices shown are cash prices and do not include shipping. Add 3% for VISA or Mastercard, 5% for American Express. Add 7% for rush handling. Cirrus, LaCie, Silverlining, Silverserver and Silverplatter are trademarks of LaCie Ltd. Macintosh and LocalTalk are trademarks of Apple Computer. Prices and specifications shown are subject to change without notice.

Plus 31 other features! Call us for a full list.



Macworld Expo— San Francisco

An overview of new products

When things become too big, we tend to gloss over them (remember "billions and billions of stars"?). Engineers and software programmers have a name for this syndrome. When they come to the part where the code isn't written yet or the ideas aren't fixed, they like to say "hand wave," referring to all the gesticulation that normally accompanies things we can't describe. The Macworld Expo has become so big an event-more than 50,000 attendees—that people are wont to say, "you know, there just isn't anything exciting at the Expo anymore." What they're really saying is that there's too much to comprehend, too many hundreds of new products to put it all into some understandable, comprehendible, get-your-hands-around-it-and-call-itone-cute-thing form. But I'm going to try.

For four days I walked the floors of the Macworld Expo's two locations: San Francisco's gleaming convention hall, Moscone Center, and the tattered old Civic Auditorium. I think I stopped at every booth and asked what was new—but I wouldn't want to swear that I saw everything. Because I spent nearly all my time on the show floor, I certainly didn't see all of next summer's products being shown in the hospitality suites off the show floor. I've since heard that there was some really neat stuff outside of the show—hand wave.

Mac SE/30

Apple announced its 68030 in a Macintosh chassis with the host of great features we discussed in our March issue. What's most important about the

announcement for me is that it shows Apple is keeping its promise to launch a steady stream of products-vital not only to the continued growth of the thirdparty products that we all love, but also to the long-term competitiveness of Apple Computer. Now for about \$5000 we can buy a small computer from Apple that competes with anything other vendors can produce—the low- to midrange machines from Sun and Apollo, for instance, not to mention the 386 family of machines. Sure, if you run some benchmarks on one of the fast Compag machines you'll see that it competes with the SE/30, but to choose the Compaq over the SE/30 you'll have to ignore the SE/30's better interface, networking, software, and so forth. And the fact that you can easily add a large-screen monitor (that will perform better than it would on the original SE due to a change in the connection to the system board) gives new Macintosh puchasers a reason to spend the extra money for the SE/30. Not that engineers, programmers, and anyone who can actually make use of A/UX or floating-point math-based applications will hesitate. This is another dream machine for those who don't need the expandability of the Mac II.

Accelerators

Is there no end to demands for computing power? No. There are many out there who want faster machines. In fact, an accelerator for the SE/30 was announced the day Apple announced the new machine. Good news for owners of all machines, from the Mac 128K to the Mac II, is the large number

of accelerators available for these machines. Spectra's Proboard and Total System's Gemini, for example, will change your 128K Mac to a Motorola 68020-based machine that rivals the speed of the Mac II (you worry about finding the SCSI interface). And for Mac SE and II owners, there are new 020 or 030 accelerators from DayStar, Dove, SiClone, Aox, Mirage, CSA, and Irwin. Of course, Apple also offers an upgrade for the Mac II and SE, so keep in mind the traditional trade-offs: the security you get with an Apple product versus the features and lower cost typical of a thirdparty offering. DPI offers a \$269 upgrade for the Mac Plus.

Performance

How to get greater speed from the Mac was one of the major themes at the show. Disk and memory access are crucial to speed on the Mac (see "Ten Ways to Speed Up a Mac," in this issue), and many vendors are responding to demands for speed. RAM cache boards are available from Pinnacle Micro, Jets Cybernetics, Golden Triangle, Orchid, and National Semiconductor. The RAM cache is high-speed RAM that allows the CPU to speed up data handling; the DMA boards speed the flow of data from your hard disk to the processor. National Semiconductor was also showing a brute-force solution-a NuBus board for the Mac II, with 64MB of RAM, that keeps applications and huge files all resident in high-speed memory. Alterna-

(continues)

Low-Cost Macintosh[®] Data Acquisition

New SCSI Hardware and Software Solutions for Macintosh Computers



Turn your Macintosh Plus, SE or II into a low-cost laboratory computer that's powerful and easy-to-use. These simple, versatile outboard boxes provide a variety of I/O options, 28.8k samples/sec throughput via the Macintosh SCSI bus, and control from programming languages or menu-driven programs.

Call and discuss your needs



The Macintosh Data Acquisition Company

35 Medford St., Somerville, MA 02143

Circle 124 on reader service card

Commentary

tively, you could employ another person and buy a couple of Mac IIs with the money.

Monitors and Video Controllers

There are simply too many to list here—which is why these days we have to run two or three major monitorevaluation articles a year. Our editorial offices look like the wharfs in some busy shipping port when we start receiving these things for review. One note of interest: several major suppliers to the IBM PC market have announced their interest in the Mac market over the past year, including Sigma, Princeton Graphics, Taxan, Mitsubishi, NEC, and others. But in this market they supply video controllers as well—Sigma began last year, and now Taxan has entered the market. After some initial specifications from Apple regarding 32-bit Quick-Draw, many of the older Mac video suppliers have felt compelled to show 24-bit or 32-bit video boards: SuperMac, RasterOps, Radius, Micron Technology, and PCPC were all demostrating such boards. RasterOps also showed its OPDM video board (with an on-board AMD drawing processor), which speeds QuickDraw considerably, depending upon the application. This is the first attempt to use hardware to accelerate QuickDraw.

Storage

Three aspects of storage technology stood out at the show: removable hard drives; high-capacity hard disks; and numerous optical offerings. Mass Micro and Jasmine started the trend in removable 45MB hard drive media, followed by Microtech International, CMS Enhancements, and Crate Technologies. These things are great—a godsend if you have a lot to back up and can't really afford to stack up 300MB drives. The large capacities, 300MB and 600MB, always astonish me. I grew up in an era when 300MB meant a box that looked like a small freezer and was locked up on a raised floor. A 600MB internal for your Mac II? What do you do when it crashes, commit suicide? What do you back it up with—another 600MB drive? Anyway there were 300s and 600s from Imprimis, MicroNet, Relax, Microtech, and Jasmine.

The optical drives at the show were legion, and both the write-once, readmany (WORM) and erasable optical (EO) types were represented. Incredibly, only last winter the erasable optical drive for the Next machine was considered a risk. a breakthrough technology. Now it's got a SCSI interface and is available at a dealer near you. Storage Technology (WORM), Relax (EO), PCPC (EO), CMS, Jasmine, Dolphin Systems, Laserdrive, Macsetra, and Sumo all had drives, ranging in price from \$3400 to \$4900. So now we have 600MB to 800MB of storage available. Access time will be a problem, compared with magnetic technologies, but in many applications speed considerations will be outweighed by the ability to store and erase on an optical drive.

Color Output

Another oft-repeated complaint from those skeptical of color graphics on the Mac is the old saw "but there's no way to get hard copy." There are plenty of ways—the problem is cost and processing time. Agfa-Matrix showed what it says will be the first PostScript film recorder. Howtek had a \$9000 thermal PostScript printer; Schlumberger, a \$20,000 color thermal PostScript printer that will compete with the QMS Color-Script; and Tektronix unveiled a Post-Script-clone, networked version of its thermal printer. Tektronix also showed a 216 dpi ink-jet printer for QuickDraw only. Hewlett-Packard had a driver kit (\$125) for its PaintJet. And QMS showed its \$12,995 PS2200 B-size laser printer (noncolor), only the second B-sizeoutput plain-paper laser printer on the market. Crosfield Lightspeed announced the completion of a driver for its color prepress software for Hell and Scitex laser film plotters, and for Dicomed film recorders. Kodak showed and is shipping a thermal printer, the SV6500, that produces 3-by-4-inch prints of E-6 photographic-processing quality. Finally, Presentation Technologies had a new film back for its cameras, which enables you to make 3-by-4-inch transparencies or overhead presentations. And color output is only going to get better.

(continues)

Ten Reasons Why FileMaker® Users Are Switching To Panorama

Panorama's drawing package is far superior for creating and revising forms. In fact, no other database even comes close to Panorama's drawing capabilities. If you've ever struggled with FileMaker® to get a form to look just right, you'll really love the Panorama difference.

O. Panorama's built-in charts eliminate the hassle of transferring data to a separate charting program. Each chart is totally integrated with the data, and instantly updates to reflect any change.

2. Panorama dramatically **Improves** data entry speed and accuracy. If you're not the best typist in the world (or even if you are) you'll appreciate our exclusive data entry short-cuts like Clairvoyance® and Value Bars.

3. Recordable macros make anyone a power user. Customize your databases by adding macro buttons and menus.

Panorama's exclusive Flash Art gallery revolutionizes the way databases handle pictures. Until now, using pictures in a database meant tediously pasting in one picture at a time. Panorama's Flash Art avoids this time-consuming process by letting you key in pictures by name.

8. Panorama lets you work with both

form and spreadsheet views of your data at the same time. Panorama's row/column spreadsheet view is simple and intuitive to use.

4. Powerful mall merge does everything but lick the stamps. Panorama can organize and maintain accurate mailing lists, create and print customized form letters and mailing labels, and even

calculate postage.

-20" Grape Assess St. Security States of Chicago Assess St. Security St

Outlines are an indispensable organizational tool you won't find in any other database. Panorama organizes your data into an outline structure on command, then automatically calculates summaries for each outline level. You can expand the outline to show the detail, or collapse it to see the big picture.

9. Panorama can import your existing FileMaker® data in seconds (over 10,000 records per minute). As an extra bonus, your files will actually shrink by 40 to 90 percent when converted into Panorama. Panorama can also convert data from 4th Dimension,™ Double Helix,® Excel, Works, and many more—all in seconds.

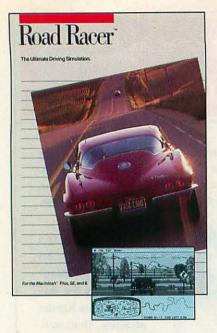
10. If the first nine reasons sound good, wait till you see how incredibly fast Panorama Is. Like its predecessor OverVUE, Panorama establishes a quantum leap in database performance. Panorama out-searches, out-sorts, out-calculates, outperforms, and generally outclasses the competition.

Panorama - from the makers of OverVUE.



OverVUE USERS - CALL FOR SPECIAL **PANORAMA** OFFER!

15180 Transistor Lane • Huntington Beach, CA 92649 • (714) 892-8199



Speed limit 200. Strap yourself in for the ride of your life.

Road Racer's detailed graphics and digitized sounds simulate driving conditions in 5 environments ranging from high-speed desert flats to twisting mountain roads. So convincing you'll actually find yourself trying to look over the hills and around the turns.

The trees, rocks, telephone poles, and other graphics fly past your 1965 Corvette at breakneck speeds. Hear its thundering 350-horsepower engine and screaming tires as you corner around wicked curves.

Steer and accelerate with the mouse, and use your keyboard for brakes and shifting.

Each level is tougher than the last with unpredictable road hazards and many courses to travel. You score points for fast, skillful driving. Road Racer is high performance you won't forget.



© 1988 PCAI 612-427-4789 Road Racer is a trademark of PCAI

Circle 291 on reader service card

Commentary

Graphics

A perpetual favorite, Mac graphics never ceases to surprise me. Levco has ported all of Pixar's Photorealistic Renderman software to its transputer board on the Mac II. Minicomputerbased animation software, the result of a decade of development, is now available on the Mac. Cricket announced a new color-paint package. Electronic Arts, in a tour de force, showed 8-, 16-, and 24-/32-bit versions of its Studio paint program. SuperMac showed a 24-bit version of PixelPaint. LaserPaint has a new version (1.9) with a better interface. SuperPaint version 2.0 has finally shipped, and in the SuperMac booth was a truly innovative CAD system for fashion design. VIDI (Visual Information Developer Inc.), formerly VII, has redesigned two earlier imaging and animation programs into a package called Presenter. A firm from France, 2AI, is selling its Bimage image-processing software in the United States. Strade has finished its presentation software for the Mac, PresentationPro. Letraset was quietly showing a color version of its ImageStudio software off the show floor (ColorStudio). Enabling Technologies showed a new 24-bit version of Pro3D, as well as a rendering package called PhotoFinish expected to be ready in the second quarter of 1989. It really looks exciting. MacroMind released MacroMind Director (its working title was Video-Works Professional), selling for \$695.

Desktop Publishing

At the Expo there was actually relatively little happening in the mainstream DTP world. Interleaf announced version 3.5, and Brøderbund's TypeStyler should be shipping by the time you read this. But the main additions to this market came from font suppliers: Bitstream, Compugraphic, Varityper, Olduvai, Image Club, Casady & Greene, GCC, Adobe, and Postcraft International (which showed two new packages of font effects). Icom Simulations' MacKern allows kerning to be added to outline fonts. Altsys, developer of Fontographer, has a new \$99 product, KeyMaster, which allows development of EPS fonts. Kingsley/ATF introduced Type Foundry, an outline-font design system for \$495, and ATF Typographer, a \$595 pagelayout program.

In the realm of advertisement layout, Multi-Ad Services showed Multi-Ad Creator for design and layout of newspaper ads. It costs \$995.

Clip Art

Desktop publishers and others seem to have an insatiable appetite for clip art—this category of products has expanded dramatically over the past two years. New libraries of clip art—primarily in EPS format—were announced by Multi-Ad, Adobe (libraries of PostScript patterns and textures), T/Maker, Image Club, Dream Maker, Casady & Greene, and 3G Graphics.

Word Processors

The big news is that Claris has announced MacWrite II, a completely rewritten version of the Mac's best-selling word processor. Paragon Concepts is shipping Nisus, a technical writing—oriented word processor. Deneba has shipped BigThesaurus, the first licensing of *Webster's New World Thesaurus* in an electronic form. This one contains antonyms, synonyms, derivations of words, and their grammatical identity.

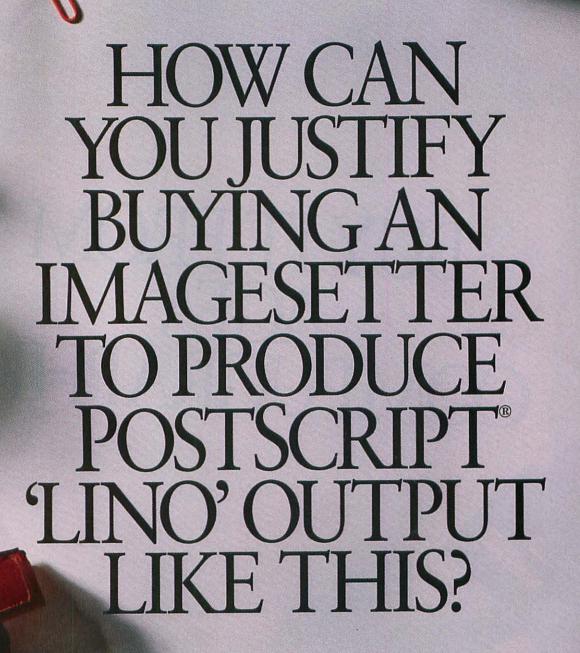
Math Processors

One small field of products—math and equation processors—is undergoing tremendous growth; Wolfram Research's Mathematica is only one of the latest. New versions of MathType, MacEqn, and Expressionist are all in the works. Bonadio & Associates is demonstrating Theorist, an algebra processor with 3-D color graphics. A new package for the Mac, Numerica was announced at the show. Paracomp began shipping its math processor, Milo. The field has moved rapidly from merely printing mathematical formulae toward interactive mathematics and printing on the Mac.

OCR

Optical character recognition has moved faster on the Mac than on any other computer, in part because of its use of typefaces. Mac software recognizes font outlines, so we should expect

(continues)

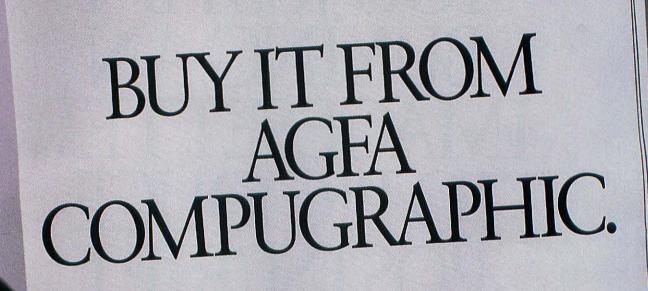




JOB NO: COM 1686 FORM1 PROOF1 OPERATOR NO: 18

TYPEFACE: SABON LIGHT 72PT CAPS TRACK1 N658926

OUTPUTSYSTEM: CG9400PS DATE: 2.28.89 CLIENT: ANDERSON





JOB NO: COM 1686 FORM2 PROOF1 OPERATOR NO: 18

TYPEFACE: SABON LIGHT 72PT CAPS TRACK1 N658926

OUTPUTSYSTEM: CG9400PS DATE: 2.28.89 CLIENT: ANDERSON



A lot of people think it's a good time to add high-resolution POSTSCRIPT output capability.

They're right.

A lot of them also think the only way to do it is with a Linotronic machine.

Because now AGFA Compugraphic offers you a better alternative. Our CG 9400-PS's combination of professional features and affordability—under \$50 a day, leased "—finally makes adding a POSTSCRIPT imagesetter make sense.

A BETTER WAY TO ADD POSTSCRIPT

If you buy a Linotronic L200 machine, you'll have to settle for a top resolution of 1693 dots-per-inch. Good enough for some jobs, but will it satisfy your most demanding customers? Or you? For about the same price, our 9400-PS has a top resolution of 2400 dpi. To get output that sharp from a Linotronic machine, you'd have to spend almost twice as much for an L300.



Can you justify that?

And if you also want to output non-POSTSCRIPT files, buying a 9400-PS makes even more sense. Unlike the L200, our imagesetter can be configured to output both POSTSCRIPT and most non-POSTSCRIPT files. That's because its raster image processor (RIP) and writing engine are designed as

separate, modular units. The modular design also lets you upgrade to our faster 9600-PS, or our wide-measure 9700-PS, without replacing your entire system. Again, to get the same functionality from a Linotronic machine, you'll have to spend about twice as much for an L300.

Can you justify that?

WORRY-FREE SERVICE AND SUPPORT

AGFA Compugraphic equipment is designed to seldom require servicing. But if you do need service, you should know that we have five times the service force of our closest competitor.

If you ever have a problem, we guarantee that a service technician will be in your shop within a single business day. Which is something our competition won't promise.

FREE HYPERCARD™ STACK FOR YOUR MACINTOSH®

Whether you're a typesetter, printer, publisher, designer or run an in-plant shop, the 9400-PS is the most cost-effective way to add high-resolution POSTSCRIPT output to your operation.

If you'd like to speak to an AGFA Compugraphic representative or get more information, send in the coupon below or call us toll-free at 1-800-227-2780 (in Canada 1-800-387-9533). We'll send you our free HyperCard POSTSCRIPT Products Overview diskette. (You'll need a Macintosh with HyperCard to view this program.) It's an entertaining, self-guided tour of the AGFA Compugraphic family of POSTSCRIPT output devices.



JOB NO: COM 1686 FORM3 PROOF1 OPERATOR NO: 18

TYPEFACE: SABON LIGHT 12/13 10/11 TRACK1 N658926

OUTPUTSYSTEM: CG9400PS DATE: 2.28.89 CLIENT: ANDERSON

□ Prn very interested in your POSTSCRIP1 imagesetters. Please have a representative contact me. □ I'd like to know more. Please send me more information. □ Send me your free HyperCard TM POSTSCRIPT Overview.	Mail to: AGFA Compugraphic, P.O. Box N1098 New Bedford, Massachusetts 02746-9961
Name	AGFA 🤲
Title/Company	AGFA COMPUGRAPHIC DIVISION
Address	AGPA GOIM CO
City/State/Zip	



Circle 187 on reader service card

Commentary

OCR technology to move ahead. Xerox's recent acquisition of Datacopy has led to cross-fertilization of Kurzweil OCR and Datacopy technology for the Mac. Xerox/Kurzweil/Datacopy announced AccuText for the Mac. Olduvai has a new version of Read-It, its trainable OCR software that also runs on the new handheld scanners from Logitech, Thunderware, and Computer Friends. Tutorland introduced new OCR software for the Apple scanner, called AutoRead.

Computer-Aided Design

While Versacad is occupied with releasing a new version, and AutoCAD has substantially rewritten its product for the Mac, Infinite Graphics is now shipping its powerful 3-D solid modeler In-CAD for the Mac, and Schlumberger is shipping MacBravo, a product based on its minicomputer line of CAD products. MSC Pal has announced its intent to port its full library of engineering analysis software from the IBM PC family, and now has a complementary geometry processor-LapCAD-that can accept data files from existing Mac CAD packages and generate finite element meshes for analysis with Pal. An Australian firm, 12 Metre Graphics, showed a hull analysis package for the Mac. Finally, Vector from MicroConcept is another 3-D Mac software entry. Development in this area has been slow for several reasons: because Mac graphics have just begun to mature in the realm beyond 8 bits of color, because developers did not understand the difficulty in writing software for the Macintosh, and because of OuickDraw's evolution.

Games

Games are also making progress. Activision Entertainment (now a division of Mediagenic) is shipping a CD ROMbased version of Manhole that is a great deal of fun to play with, but it's more a demonstration of what can be done with Mac graphics and games. Mindscape released a color version of Colony, its 3-D shoot 'em up, and Gauntlet, a Mac II color version of the arcade game. Captain Blood is on the way. Microillusions showed Faery Tale, a graphics-and-text adventure game. PCAI is now

shipping Road Racer for the Mac II, an adaptation of PoleRunner, the race-car track game.

Artificial Intelligence

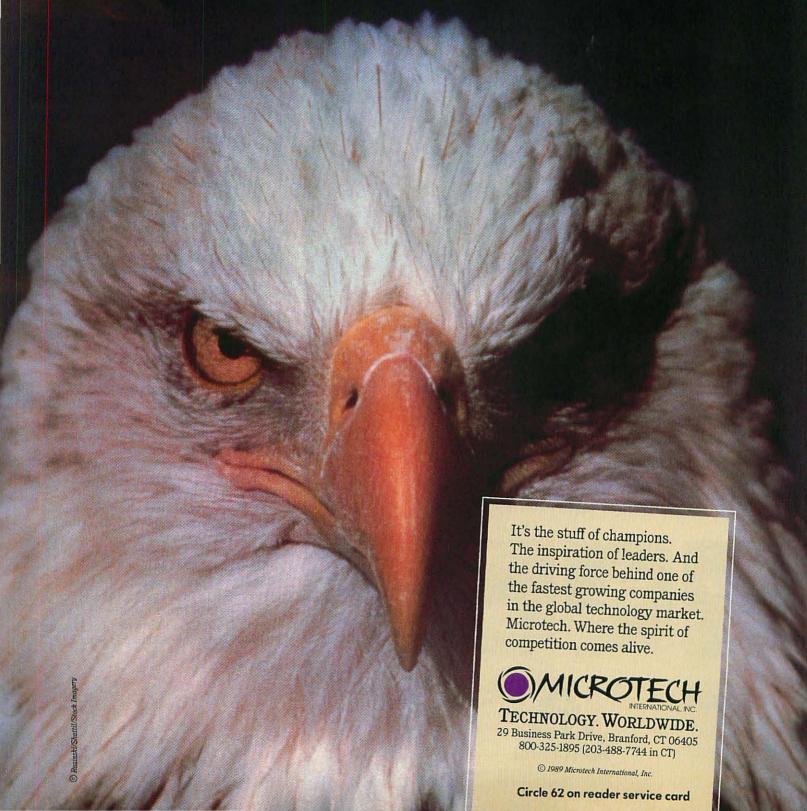
Al appears to be having a period of strong growth. Texas Instruments (which wagered on the Mac II by selecting it as a base platform for its LISP processor-based microExplorer) showed several new products in its booth, including KEE, a new \$30,000 knowledge-based development system from Intellicorp. Symbolics, which similarly decided to put a LISP processor on a NuBus card, was showing its MacIvory product in the National Semiconductor booth. It made me wonder if the Mac could, through some strange twist of fate, end up becoming the platform that AI developers have long sought. Both Texas Instruments and Symbolics have flirted with Sun Microsystems for years now. Neuron Data has forged a strategic alliance with Oracle, the \$400 million (per annum) developer of databases, and ExperTelligence has a new product called Action (a development support product), which sells for \$1995. Cognition Technology is well into development on the professional version of MacSmarts. All in all, a very good show for this area of technology. Coral, developer of LISP for the Mac, was recently acquired by Apple, so there appears to be some growing interest in what the Mac can do in this field.

Weird and Wonderful

A new category, or at least a new heading for products that are neat but that don't deserve a separate heading. One of the best was a wireless version of AppleTalk from DataSpace, called Arlan/Telenode. MultiClip from Olduvai allows you to open multiple clipboards simultaneously. Avery and Williams & Macias offered laser labels. Julian Systems is marketing a high-end video editing system from Seahorn Technologies. The color FX board from Mass Micro creates special video effects for

(continues)







Look for our name.

AnthroCart®

Call us for more information: 800-325-3841





Made in U.S.A. All steel frame construction Easily holds up to 150 lbs.









Anthro* Technology Furniture* 3221 N.W. Yeon St. Portland, OR 97210 503-241-7113 Telex: 940103

AnthroCart and Technology Furniture are registered trademarks of Anthro.

Commentary

the Mac akin to the ADO from Ampex. Berkeley Systems Design showed Outspoken (okay, I don't like Macin-Talk). I saw a host of boards for industrial purposes from National Instruments and Strawberry Tree Computers. Kensington Microware has a glare filter for 19-inch monitors (please, someone build one that affords us some radiation protection). Virus protection was available in a new version of Virex from IC Software and in BulletProof from Spectra. The WristMac from Ex Machina is an LCD watch that accepts 80 watch-screens of data from the Mac and also downloads to the Mac. Finally, Personal Writer's latest version of its software makes its tablet useful for more than just handwriting recognition.

Communications

No summary of Macworld Expo would be complete without a mention of communications products, but as with hard drives and monitors I can only point out a few. In the all-important category of Mac-PC connectivity, DataViz has a mountain of updates for AFP, which will also show up in products from Dayna and TOPS (both of whom license the DataViz file translators). There is also a new version of MacLink Plus (4.0). Insignia's new version of SoftPC, the software that allows DOS programs to run on the Mac, incorporates functions such as cut and paste, use of the SWIM chip, and background operation. PerfecTek, developer of the first 80286 board for the SE, now has a 286 board for the Mac II, and in cooperation with Datasys, allows for speedy operation of DOS programs in a window on the Mac. It's real strange running Lotus 1-2-3 on a Mac II, but at least it's fast with these products.

Many companies released communications boards for the new SE. Avatar has a Mac Mainframe SE/30 (and a new version of the software) as does DCA with MacIrma SE/30 and Kinetics with EtherPort SE/30. Similarly, Tri-Data Systems has advanced its Netway family of products for IBM mainframe connections. Dove has an Ethernet card for the SE/30. There are additions to the DEC

(continues)

Our removable hard disk isn't the only thing you'll put in your pocket.



Like the best removable hard disk drives on the market, ours gives you 42 megabytes capacity on each disk cartridge. So you get unlimited storage, and unprecedented portability and security, just as you'd expect.

It delivers super-fast 25 ms

access speed, for the finest performance money can buy.

It comes with the MacTREE Plus hard disk management system and DS BACKUP software, plus all the cables and terminators you need. Which is more than you get with a lot of the others.

What's the big difference? Simple. Buy ours and you'll save several hundred dollars. Plus you'll get the only two year limited warranty in the high-capacity removable disk drive business. And a full year on our cartridges.



So when you think about it, the real question is not why our removable drive costs so little. But why do theirs cost so much?

Call now to place your order, or for more information.



1-800-325-1895 (203-488-7744 in CT)

© 1989 Microtech International, Inc. All product names are trademarks or registered trademarks of their respective owners. The two year limited warranty is offered on the subsystem only.

Microtech hard disk cartridges come with a one year warranty. Pricing and specifications are subject to change.

MasterCard and Visa accepted at no extra charge.

Circle 458 on reader service card



INTRODUCING THE SHORTEST DISTA

Most presentation software seems to be for people with lots of time and a degree in graphic design. But if you're like most business professionals, you probably have neither.

So we borrowed a page from our PageMaker® experience, and developed a new technology for automating the process of creating presentations.

The technology is AutoTemplate.™
The program is Aldus® Persuasion.™ And it's the most streamlined way to create great presentations with your Macintosh® Here's why.

Using the AutoTemplate technology, all you have to do is select a design, type your ideas into the text outliner, and you're done. Aldus

Persuasion automatically formats your outline into professional-looking slides or overheads,

> using one of the program's pre-formatted designs or one of your own.

You can literally create and change a presentation as fast as you can type your

ideas into an outline.

If you want to embellish your presentation, feel free.
Persuasion lets you be more creative with text formats, styles, and colors than any other pre-

sentation program.

ntroducing Samurai Sushi

*Offer expires February 28, 1989 and is good in the U.S. and Canada only. Demo disk requires a

Macintosh Plus, SE or II. Aldus, PageMaker and the Aldus logo are registered trademarks and Aldus Persuasion



NCE BETWEEN THESE TWO POINTS.

Tables and graphs are easy to add, too. Persuasion automatically generates practically any kind of graph right from the program's data sheet. Or from imported data from spreadsheets such as Microsoft® Excel. And if you want to generate organization charts, Persuasion can do them instantly right from the outliner.

And you can be artistic with Persuasion. It includes powerful drawing tools, special effects, and clip art. So you can easily create flow charts, conceptual diagrams, and logos. Or import art from other graphics programs.

And because Persuasion is the most complete program for presentations, it includes a spelling checker, slide sorter, and an on-screen "slide show" feature. It also generates speaker notes and handouts.

Your output can be color or black-and-white; slides or overhead transparencies.

And film recorders, laser printers, or service bureaus can also be used.

To see just how short the distance can be between your ideas and a professional presentation, call us at 1-800-333-2538, Department D-2 for a free self-running demo disk.* Or visit your authorized Aldus dealer today.

ALDUS Persuasion
411 First Avenue South, Seattle, WA 98104, (206) 622-5500

Grappler Spooler

PRINTING DOESN'T HAVE TO MEAN WAITING

Simply stated, a "spooler" allows you to simultaneously use your Mac while your printer is printing. No more waiting. You get more done, faster! Whether you have an ImageWriter II, ImageWriter LQ, or you're using any dot matrix printer

with the Grappler C/Mac/GS, the new Grappler Spooler lets your Mac do two jobs at once.

General Panel

Install Specier

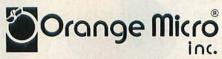
Over No On Off Help

Specific No O

The Grappler Spooler loads into your Mac's control panel for easy access. You can queue up to as many print files as your disk will hold, and manage that queue with commands like Move To Top, Defer, Delete, Cancel and more. The Grappler

Spooler even works in MultiFinder.

Suggested Retail: \$79



1400 N. Lakeview Ave., Anaheim, CA 92807 (800) 223-8029 (714) 779-2772

Requires Mac Plus, SE, II or IIx with minimum 1MB of RAM. A hard disk is recommended. System 4.2 and Finder 6.0 or later is required.

Circle 265 on reader service card



Circle 219 on reader service card

Commentary

connectivity environment from Synergy Software (maker of VersaTerm) and from White Pine Software. Software Ventures was demonstrating a new version of MicroPhone II that supports icons. Hayes has a new version of Smartcom II for Hayes-compatible modems. Infosphere is now shipping its network management software, Liaison, which bears some similarity to the SilverServer and SilverLining products from La Cie (new versions of these are also shipping).

Although a number of new products are coming from Farallon, none were on the show floor. Farallon has found such success (having shipped over 700,000 AppleTalk nodes, it now rivals Apple) that it has engendered competitors such as Nuvotech, which also sells an AppleTalk replacement cable and networkanalysis software. Nexsys has entered the network-diagnostic-software market with Intellinet.

New Versions

Other new updates you should get if you already own the products: PixelPaint 2.0; Works 2.0; Graphisoft/
Archicad 3.31; Managing Your Money 2.0; Clients and Profits 4.0; Picture Base 2.0; MacSafe 1.03; WordPerfect 1.02; SmartScrap 2.0; Pegasys 3.2; PowerPoint 2.01; Fox Base+Mac, the multiuser version; FreeHand 2.0; DeskPaint 2.1; Inside Out 1.2; VersaCAD 2.1; McMax 2.0; Courseware 1.5.

Congratulations on Shipping to...

Oracle, Silicon Beach (SuperPaint 2.0), Claris (SmartForms), T/Maker (WriteNow 2.0), and all the rest that I've no doubt forgotten.

It's Still Not Enough

Well, there is more. Send a self-addressed, stamped envelope with 45 cents in postage (for six double-sided sheets) and I'll send you a list of this year's announcements. Write to me, care of *Macworld*, 501 Second St., San Francisco, CA 94107. Can you believe there is another Expo in April? By the time you read this, I will be walking the show floor in Washington, D.C., looking for the next set of new products for the Mac. □

Special **Anniversary**



We're celebrating our fifth year anniversary. Join us for incredible savings on every issue of Macworld.

Discover Macworld with a Special Anniversary Savings Rate!

• \\\\ | = \\\\

Each issue is packed with powerful techniques, straight-shooting reviews, tips and how-tos.

☐ YES, send me one year (12 issues) for only \$24.00. That's almost 50% off the annual cover price of \$47.40.

☐ Even bigger savings! Send me two years (24 issues) for just \$37.90.

Company _____ Please Bill Me

Address _ ☐ Payment Enclosed

City/State/Zip _

This rate limited to the USA and its possessions. Basic subscription price is \$30 for 12 issues. The annual cover price is \$3.95 per issue, \$47.40 for 12 issues. Please allow 6 weeks for delivery of the first issue.

4AKM4

INTUITIVE

Develop an understanding of the Macintosh with thought-provoking articles and insightful features.

☐ YES, send me one year (12 issues) for only \$24.00. That's almost 50% off the annual cover price of \$47.40.

☐ Even bigger savings! Send me two years (24 issues) for just \$37.90.

☐ Please Bill Me

Address _

☐ Payment Enclosed

City/State/Zip_

This rate limited to the USA and its possessions. Basic subscription price is \$30 for 12 issues. The annual cover price is \$3.95 per issue, \$47.40 for 12 issues. Please allow 6 weeks for delivery of the first issue.

User-friendly hints and applications to make using the Mac more fun and productive than ever before.

☐ YES, please send a one year subscription (12 issues) to my associate or friend listed below for only \$24.00. That's almost 50% off the annual cover price of \$47.40.

☐ Please Bill Me Later.

Send Gift To:

Send Gift From:

Name .

Company __

Company _

City/State/Zip -

2AEW8

City/State/Zip_ This rate limited to the USA and its possessions. Basic subscription price is \$30 for 12 issues. The annual cover price is \$3.95 per issue, \$47.40 for 12 issues. Please allow 6 weeks for delivery of the first issue.

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Subscription Department P.O. Box 51666 Boulder, CO 80321-1666

Hahilandhahialladhalladhallaladh





UNITED STATES

When You Subscribe Today!

No other magazine helps you like Macworld. Powerful, Intuitive and Friendly. Macworld is a wealth of information which keeps you up to date on the latest products, news, tips and tactics. Dedicated exclusively to the Mac II, SE and Plus.

We look out for your interests. We tell you what's new for the Mac. What it does. Who it's for. Compare similar products—and name names! Discuss pros and cons. Assess value for mone for both hardware and software.

Macworld helps you make the most of your Mac.



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Subscription Department P.O. Box 51666 Boulder, CO 80321-1666

Holdhandhalladhalladhalladhalladh



NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Subscription Department P.O. Box 51666 Boulder, CO 80321-1666

Haldlandladadladlalladladladadl



MAIL THE ATTACHED CARD TODAY!



Ever feel like your project is managing you?



You're behind schedule, over budget, and out of excuses. Suddenly, your project's become a monumental drag. What do you tell the boss?

Help is on the way. With MICRO PLANNER, the powerful project

manager that makes even complex projects a snap. In less than a day MICRO PLANNER's unique

graphic interface will have you building a step-bystep model of your project. From there, Critical Path Method will calculate start dates and deadlines,

Circle 50 on reader service card

forecast bottlenecks, and optimize crucial resources. Then you'll create impressive reports—including PERT charts and bar charts—that look as powerful on paper as on the screen.

PC or Mac, you're ready for take off.

Identical on PCs or Macs, MICRO PLANNER automatically converts files between machines. Which keeps everyone in your company pulling together.

Show your project who's boss with

MICRO PLANNER. Call Micro Planning International at (415) 788-3324 for your nearest dealer.

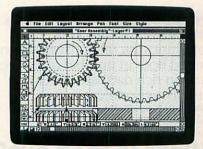


Planning for Success.

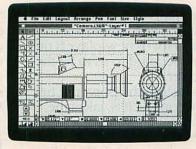


© 1989 Claris Corporation, 440 Clyde Avenue, Mountain View, California 94043; 415-962-8946. Starter Kit includes demonstration software, tutorial workbook and video. Offer expires September 30, 1989. A special

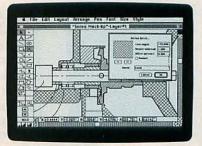
Is to start here.



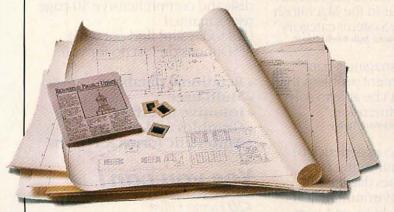
Claris CAD is the first professional 2-D design and drafting tool to fully utilize the intuitive Macintosh way of working. So it takes hours to learn, not days.



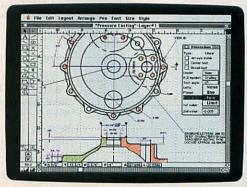
Fillets, tangents, keyboard entry; double lines and automatic dimensioning turn your ideas into realities with exacting precision.



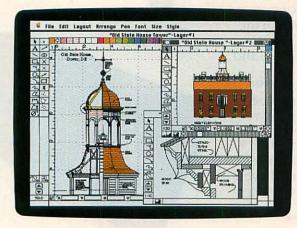
Customizable pens, dashed lines, hatch patterns and dimension appearance give you a new level of versatility:



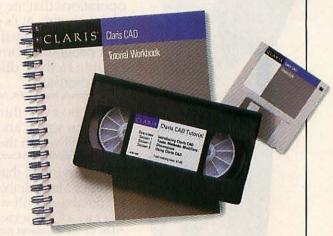
Claris CAD makes it easier to sell your inspirations. Plot your plans, concept sketches, schematics and working drawings exactly as you see them, turn them into slides or overheads, or cut and paste them into proposals and reports.



Keeping the vision in your revisions is easy. Because you don't have to redraw from scratch.



Claris CAD integrates with other CAD software via optional IGES and DXF conversion programs. So you can move them to larger CAD/CAM systems for 3-D modeling and prototyping.



Here's the next step: order the Claris CAD Starter Kit, just \$29.95 (refundable when you buy the complete program). To order, call 800-628-2100. And see how intelligent design begets intelligent design.

Introducing Claris CAD. CLARIS



"... the clear leader th DIMENSION

"Although this category, unlike spreadsheets and word processors, had a lot of new players this year, one seemed to us to be the clear leader.

4th Dimension, the powerful first product from ACIUS, takes the kudos."

MacUser, February 1988

"Congratulations! InfoWorld's readers have chosen

4th Dimension as the Product of the Year in the Macintosh Database Systems category."

Jonathan Sacks, InfoWorld, April

"I can't imagine a datamanagement problem that you won't be able to solve

with 4th Dimension."

Steve Mann, Macintosh Today
August 11, 1987

"Users with no experience or interest in programming can build a barebones database in 4D's 'Design Environment' just by pointing, clicking, and naming files and fields."

"For searches and sorts - database operations that are performed interactively - 4D's performance curve is probably the best of the four programs (Omnis 3 Plus, Double Helix II, dBASE Mac, and 4th Dimension)."

David Brandt, MacWEEK, January 19, 1988

"It will do everything you need, and then some, and will prove itself well worth the cost.

Jan L. Harrington, MacUser, November 1987

"I'm convinced that many users of other Mac databases and even PC databases will want to switch over to 4th Dimension."

Adam Green, Macworld, July 1987

"In general, Macintosh software is better than software for other personal computers...

4th Dimension redefines those high standards."

Andrew Gore, The Macintosh Buyer's Guide, Spring 1988 ■

"4th Dimension from ACIUS, Inc. of Cupertino, California, outshines the other databases we tested both in number of features and in rich database development environment."

Don Crabb, InfoWorld, January 11, 1988

Want to try it out?

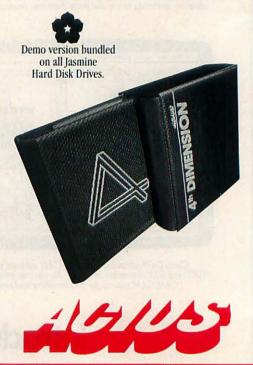
For \$20, we'll send you a demo disk and comprehensive 50-page user's manual. Call today and find out what

4th Dimension can do for you.

- Relational database
- Multi-user
- Intuitive interface
- Graphics and pictures
- Automatic forms & reports

Yes you can!

\$20 Demo Offer 1-800-952-6300 Ask for Dept. A22



4th DIMENSION is a trademark of ACIUS, Inc. and ACI. All other brand names are trademarks of their manu10351 Bubb Road Cupertino, CA 95014 (408) 252-4444

Letters

A forum for Macworld readers

Lights, Camera, Action

I am a college student who hopes to become a writer. I will begin my studies in the screenwriting program at San Francisco State University in the fall of 1989. Is any script-writing software available for the Mac Plus?

> Mario Alejandro Henriquez San Francisco, California

There are several, including CineWrite (at press time, 2.3 was the current version; a newer version should be out by the time you read this), \$495, from Max3, 213/398-3771; and Scriptwriter, also \$495, by American Intelliware, 213/533-4040 (recently we've had problems contacting this vendor). Thomas Brown, a New York independent film producer, uses Scriptor 1.4, \$295, by Screenplay Systems, 818/843-7819. Hal Barwood, a writer/producer/director who bas worked for Lucasfilm, finds scriptwriting programs too cumbersome and inflexible. Instead, be uses WriteNow and creates a screenplay format using Macro-Maker (part of System 6.x), then saves the format to apply to bis work.—Ed.

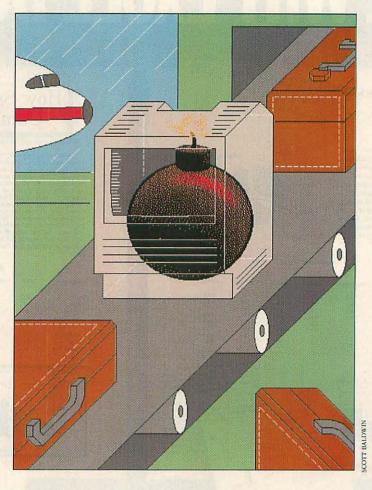
A Bomb Hits Shanghai

Last year I worked in China on a French film as first assistant director. It was the

Corrections

The Connect Professional Information Network ("Great Communicators," December 1988) is run by Connect Inc., 10101 Bubb Rd., Cupertino, CA 95014, 800/262-2638; MacNet is its telecommunications software for the Mac.

The phone number for Carina Software, maker of Voyager (Macworld News, February 1989) is 415/352-7328.



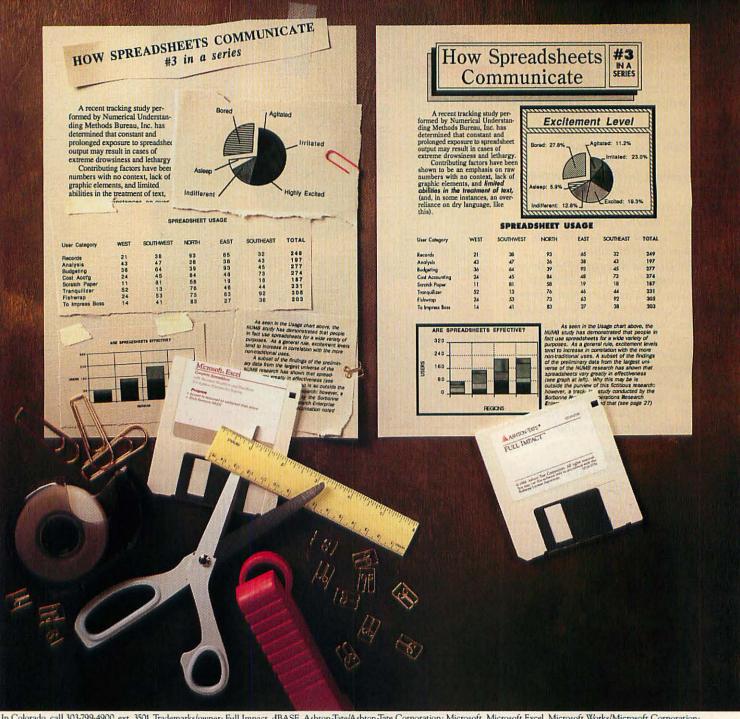
third film on which I used my Macintosh but the first time I traveled with it in such a remote country. Needless to say, my colleagues at the Shanghai Film studios were fascinated with my "magical box." While it took me three days to schedule 23 weeks of shooting, they needed a crew of ten assistant directors to deliver hand-written the same work. My last day in China, as I was leaving Shanghai for Hong Kong, I had to put my Mac through the X-ray machine before boarding my plane. The woman at the machine asked me to open the Mac. After explaining to her that I couldn't, I convinced her to let me switch it on so she could see that no bomb or gun was hidden

inside. After plugging in my transformer and wiring everything in front of two customs officers and a translator, I prepared to show them the beauty of MacPaint. They were looking for a bomb and they got one as soon as I booted my HyperDrive!

Pierre Magny Montreal, Quebec, Canada

A Lack of Communication

Your article "Great Communicators" [December 1988] states that VersaTerm-Pro offers Tektronix graphics terminal emulation not available in other programs. We would like to point out that our TextTerm+ Graphics not only offers Tektronix graphics terminal emulation but also provides the



It's the difference between merely analyzing something, and actually seeing what it means.

Introducing Full Impact, from Ashton-Tate.

Full Impact is a spreadsheet program designed expressly for the Macintosh that goes beyond the basic number-crunching capabilities of Microsoft Excel: it gives you the ability to easily turn your work into clean, crisp—and understandable—documents.

How? By letting you take full advantage of the way you're already used to working on the Macintosh.

Start by simply entering your data.
Then, select all or part of it, and instantly create a chart using those values—simply by clicking on the appropriate chart icon from the icon bar.

Need to write some text explaining your analysis? And highlight certain passages? Full Impact's text editor gives you plenty of fonts, sizes, and styles to choose from.

What if that block of text would look better somewhere else? Fine. Just click on it, and drag it there. You can even bring in art from other programs, then merge it with your text and data, all on the same page.

But lest you get the impression that Full Impact is merely a presentation program disguised as a spreadsheet, consider this: with over half a million usable cells (far more than any other

Macintosh spreadsheet), Full Impact



How Spreadsheets Communicate

Let a was a series of the se

gives you more than enough room to handle even the largest projects. And more than enough speed to recalculate them quickly.

You can work with as many as eight spreadsheets simultaneously. And then link them all together. Or create powerful, time-saving macros, and even customizable icons to tie them to.

FULL IMPACT vs. EXCEL

Full Impact 1.0 Excel 1.5

Power		
Usable cells with		
1 Mb RAM	512,000	50,000
Linked spreadsheets	Yes	Yes
"C"-like macro language	Yes	No
Customizable icon bars	Yes	No
Presentational Canabilitie		
Presentational Capabilitie	100	
Print charts and spread-	:5	
	Yes	No
Print charts and spread-	- AUGU	No
Print charts and spread- sheets on one page	- AUGU	No No
Print charts and spread- sheets on one page Mix fonts, sizes, styles	Yes	200
Print charts and spread- sheets on one page Mix fonts, sizes, styles cell by cell	Yes Yes	No

You can also exchange files with many other popular programs, including Excel and Microsoft Works, Lotus 1-2-3, all of Ashton-Tate's dBASE* products, and much more. So you won't lose your investment in your current data.

SAMPLE FULL IMPACT FOR FREE.

We'd like to make it easy for you to get the full impact of Full Impact. Just call 800 437-4329, ext. 3501, and we'll send you a full-capability product sampler.

What could be more impactful?

ASHTON · TATE®

WE PUT PERSONAL SCANNING WITHIN YOUR REACH.

Announcing LightningScan, the new hand-held scanner for Macintosh. From Thunderware.

Now one quick pass is all you need to scan any image up to four inches wide. With resolution settings up to 400 dots per inch, LightningScan™ makes almost any scanning job easier to handle. And because LightningScan is controlled by the software that helped make ThunderScan® famous, you have the powerful tools you need to enhance and edit your images. As for graphics compatibility, you name it: from PageMaker® and Illustrator™ to ImageStudio™ and Digital Darkroom.™

At its suggested retail price of \$549, LightningScan makes the benefits of personal scanning very easy to grasp.





Letters

fastest performance. Although we realize that the aim of your article was to highlight advanced features useful for communicating via electronic mail packages, we feel it is a disservice to your readers not to mention our easy-to-use, fast, and powerful Tektronix terminal emulator.

> James E. George Mesa Graphics Los Alamos, New Mexico

We didn't mean to give the impression that VersaTerm-Pro is the only Mac program that offers Tektronix terminal emulation. However, since our intent was to cover general-purpose telecommunications software, specialized terminal emulators were not included in our analysis.—Ed.

Time After Time

Back in 1981 I found a program for the TI-59 called Sunrise/Sunset, which calculates sunrise, sunset, and civil twilight time with accuracy for any date, latitude, longitude, and altitude. Do you know of a similar program for the Mac Plus?

Abraham Krufka East Hampton, New York

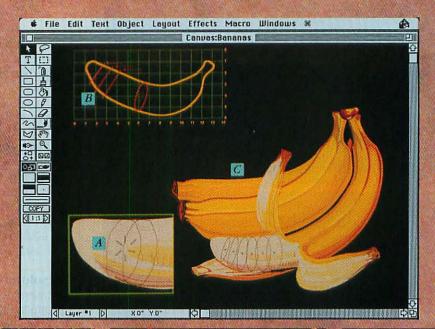
Carina Software (415/352-7328) makes a desktop planetarium program for the Mac called Voyager (see Macworld News, March 1989), which has what you're looking for. By clicking on a star, a planet, or any other object in the galaxy, you can find its azimuth (position along the horizon), its altitude, its rise and set time, and its transit time (the point at which it's highest in the sky). A DA called Sun Clock, by MIT software (503/245-7093), indicates the current areas of day and night on a map of the world and enables you to calculate the time at any location.—Ed.

From Another Perspective

I would like to add a few comments to the review of MacPerspective by David Peltz in his article on 3-D software ["3-D in Perspective," December 1988]. I was probably the first architect in Michigan to purchase MacPerspective to run on my 512K Fat Mac, shortly after I bought the equipment.

This program is an incredible improvement over the way most of us pro-

- A To an architect, fine hairlines like ours are pure poetry.
- B Auto-tracing built this banana from a scanned-in produce ad. In split seconds.
- Multi-point bezier curves make drawing a bunch easier. Colors are added in layers.
- D Auto-resizing helped this V.P. of Sales display the fruits of his labor, graphically.



E Smooth continuous color blending inspired this art director to new heights.

> F What are mere words compared to WYSIWYG text with special effects?

G After he slipped away, we added rich Postscript® gray scales to the gorilla's leftovers.







FOUR INDIVIDUALS WERE GIVEN AN HOUR WITH THE NEW CANVAS 2.0."

THREE WENT BANANAS. ONE ATE THEM.

ow an architect, an MBA, and an art director developed instant talent in precision drawing. And a gorilla developed mild indigestion.

Meet Canvas 2.0. The new top banana. Able to help even ordinary people draw extraordinary things.

Easy enough for almost any primate to master.

Use our Bezier curves and smooth polygons to build any shape. Add or delete control points and join, split, open or close them at will.

Use Auto-Tracing to save countless hours by converting existing bit-mapped images - pictures like clip art or scanned graphics - into easily manipulated Canvas 2.0 objects.

Work across unlimited layers. View, print or save them in any combination. Draw in millions of colors, or with Postscript gray scales and patterns.

Experience heart-stopping accuracy (64,000 DPI) and fineness of line (1/1000"). Zoom around from 3% to 3200% of original size. Draw continuously up to 9 feet square. Import and export freely, using PICT, PICT2, TIFE MacPaint" or MacDraw" formats. Output to any Mac compatible printer, typesetter, or film printer you want.

Like we said: go bananas.

But do it soon. While we're still throwing in Canvas 2.0 DA for free. It's a special desk accessory version that puts some 80% of these features right under your Apple menu.

And if all this hasn't convinced you that Canvas 2.0 is the drawing program you've been waiting for, send us \$9.95 to receive a fully featured Demo Copy. With which you can finish convincing yourself.

After all, power like this can be very apeeling.

Canvas 2.0 (including Canvas 2.0 DA) Site licenses available

\$299.95

Canvas 2.0 Demo Disk

For more information or a demonstration of this or any of Deneba's other products, see your local dealer or call us at 1-800-6-CANVAS. In Florida, call (305) 594-6965.

3305 Northwest 74th Avenue, Miami, Florida 33122

Read only.

© 1988 Deneba Systems, Inc.

All product names mentioned are trademarks of their respective holders.

Circle 217 on reader service card





MultiDisk The sensational new disk partitioning utility!

hard disk makers accognize the need to partition a disk. As hard disks have increased in size, the need has become critical. However, the Maximush File System is so complex and mers are so demanding, no adequate utility has been offered. We challenged the Maximush disk experts who created DiskExpress to deliver a solution. They succeeded with MultiDisk

MultiDisk provides you with effortless partitioning. You can add or delete partitions at any time without having to crase your disk. MultiDisk has the exclusive ability to create partitions that occupy fragmented space (SUM and Hard Disk Partition" need DiskExpress to defragment the free space). Another exclusive us the ability to enlarge a partition without having to recreate h. You can start with a small partition and then grow it as needed. This presents the waste of your valuable disk space caused by other partitioning software. A third exclusive it the ability to create partitions within partitions. Plass, partitions you've created with SUM or Hard Disk Partition can be converted into fixed-sized MultiDisk partitions.

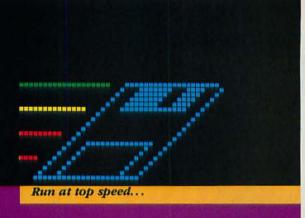
You can conveniently open partitions with a desk accessory. You can also have MultiDisk automatically open the partitions of each disk as they appear on the desktop. Network users of Applesham," and TOPS," can remotely access garitious opened on a server.

You can protect partitions with a password. For more security, you can assign automatic quick encryption to each partition.

MultiDisk partitions your HFS disks on SCSI and non-SCSI drives and has the exclusive shility to work correctly with your removable disk

Suggested Retail

\$69.9



DiskExpress Apple Computer says . . .

"Ideally, a file would be stored contiguously, however, the contents of a particular file are usually stored in different parts of a disk. This increases the time required to access that file."

Apple Computer - Inside Macintosh.

Volume IV.

DiskExpress is the only optimizer for your Macintosh disks. It is the fastest way to straighten out your files to speed the loading of your data. It does the same to your free space to reduce future delays. Only DiskExpress straightens out your disk's directory to speed access to everything.

Only DiskExpress is 100% compatible with your other software. It works with your Apple-Share "file server and your hard disk back-up program. Only DiskExpress requires no free space to operate. It cleans up all your files regardless of their size.

DiskExpress can look for bad spots on your disk. It can also show you how your free space is spread around.

"... DiskExpress should be packaged with every hard disk sold." C.J. Weigand -MA Cazino

Don't be fooled by simple file copy programs included with SLM or PC Tools, that falsely claim to be disk optimizers. They want to sell you a "package" while DiskExpress is the only real solution. Come on, SUM and PC Tools, you're no DiskExpress!!

MacWEEK agrees. "Alsoft's DiskExpress has always been the Rolls Royce... only it traly optimizes and prioritizes a disk." Demnis Klaizkin

Suggested Retail

\$69.95



ALSoft, Inc. / P.O. Box 927, Spring, Texas 77383-0927, (713) 353-4090

Albeit, Mididbiak, and Disaffapress are trademerks of Albeit, Inc., All other trademarks administrational

Circle 202 on reader service card

Letters

duce our drawings. MacPerspective enables you to input dimensional data in less time than either using the classic graphic method or using a printed perspective chart, and it lets you produce several views rapidly.

Since over half the architectural firms in this country have fewer than five people, equipment and software represent significant budget items. This inexpensive, easy-to-learn program fills a major need for the architect who isn't a graphic or computer specialist.

Albert J. Vegter Ann Arbor, Michigan

Resolutions Resolved

We were pleased with your coverage of our product, the Grappler LQ [Reviews, December 1988], but there are several points that need to be addressed. You state that graphics can only be printed at 72 dpi, or screen resolution, when actually the Grappler LQ will print graphics at up to 300 dpi, depending on the resolution of the file format you're using.

Your information on font availability is correct but incomplete. Our upgraded font package, Alphabits, includes three complete sets of fonts (small and large sizes) and five headline fonts (18-point and 24-point screen fonts supported). These are licensed from Bitstream, as are the original Grappler LQ fonts, and the package retails for \$99.

Although you claimed to have problems with our spooler, we have found it to work in all the applications we've run. We'd

like to know which ones caused problems for the reviewer.

Karl Seppala Orange Micro Anaheim, California

It's true that the Grappler LQ can print 300-dpi graphics, so long as the image is in the appropriate file format—Quick-Draw for object images, a 300-dpi format for bitmaps. (PostScript files, of course, are specifically not supported, and these images print at screen resolution only.) As for the spooler, we tested it on a Mac Plus and an HP LaserJet Series II with Excel, Ragtime, Works, Scoop, and Mac-Paint, and we experienced intermittent system crashes with most of these applications.—Ed.

THEIR LIST IS HIGH, AND SHORT. OURS IS LOW, AND LONG.

MACDRAW"II

(NO DA VERSION AVAILABLE)

Key Features:*

All the standard drawing tools

Unlimited layers

Ultra-fine hairlines

Editable arrowheads

Smooth polygons

Object libraries

± 32x magnification/reduction

Text rotation

High precision

8 available colors

Auto-dimensioning of lines

CANVAS 2.0 VS MACDRAW II

DRAW YOUR OWN CONCLUSION.

BEFORE YOU JUMP TO ONE.

If you want to see the Canvas difference for yourself, send us \$9.95 to receive a fully-featured Demonstration Copy. (INCLUDING CANVAS 2.0 DA)

Key Features:*

All the standard drawing tools

Unlimited layers

Ultra-fine hairlines

Editable arrowheads

Smooth polygons

Object libraries

± 32x magnification/reduction

Text rotation

Much higher precision

16.7 million available colors

Auto-dimensioning of lines & arcs

Join & split smooth curves

PostScript® gray scales in 1° increments

Continuous Bezier Curves

Area & perimeter calculations

Powerful Auto-Duplication options

Central Object Control dialog

Skew, perspective & distort effects

Tear-away rulers

Magnetic guide lines

Complete set of bitmap editing tools

Import & export of TIFF files

Auto-tracing of imported bitmap images

72-2540 DPI. bitmap resolution

PixelPaint™ compatible color palettes

Editable, micro-adjustable airbrushes

Full-feature DA version included



3305 Northwest 74th Avenue Miami, Florida 33122 1-800-6CANVAS In Florida: (305) 594-6965 © 1989 Deneba Systems, Inc. All product names mentioned are trademarks of their respective holders.

r respective nomers.

*Partial list

Circle 282 on reader service card

From Mac to PC

I'm a programmer for a large insurance firm. I have to use IBM PCs and mainframes at work, but I prefer to use my Mac Plus at home. Is there an easy way for me to write programs on my Mac and send them to a PC in the office via modem?

Brendan Shea Hartford, Connecticut

"A File-Transfer Primer" (in this issue) examines the various options for transferring files from a Mac to a PC. Fortunately for you, moving files from a Mac to a PC is easier than the other way around.-Ed.

Home Repairs

Somehow or other the upper drive in my SE was damaged. Having a machine that was out of warranty and being someone who enjoys tinkering, I cracked open the box and removed the drives. After noticing that the head was bent, I put the machine together and brought it in to the local computer store. There I was informed that Apple specifically (and the industry generally) does not sell repair parts; they sell disk drives. So instead of paying approximately \$15 for a part (plus labor for installation and testing), I was forced to pay \$160 (plus \$40 labor and tax). I know that my old drive will go back to Apple for repair. Why does Apple find it necessary to wring the public?

> Sterne A. Roufa Buffalo, New York

Disk drives are such complex machines that even qualified Mac technicians don't work on them; that's why they send all damaged drives back to Apple. For the money you pay, you get a refurbished drive that's been completely tested and is guaranteed to be up to specifications. -Ed

More on SE Screen litters

Apple does have a repair policy with regard to the noisy SE fan and screen jitter [Letters, November 1988]. Our repair shop told us that SEs with serial numbers preceeding F749xxxx may suffer from screen jitter. Both our SEs have lower serial numbers, and one had screen jitter. We had to pay to have the fan replaced because Apple does not consider the noisy fan to be a problem. However, the SE with the screen jitter was fixed free of charge. We were told the problem was caused by components on the analog board and not by the fan.

> Darrell Hoffman Carrollton, Texas

You're right. Apple now offers free repair through its dealers but only in cases where screen jitter occurs.—Ed.

Letters should be mailed to Letters, Macworld, 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370,702) or MCI Mail (addressed to Macworld). Include a return address. Due to the high volume of mail received, we regret that we're unable to respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of Macworld.



Circle 140 on reader service card





Some 18 months ago, the marketer of the popular spelling checker known as MacLightning ceased to be.

We here at Deneba were the program's original developers. And so we soon began marketing an improved version of what used to be MacLightning as our Spelling Coach Professional package.

Since then, we've added so many enhancements that today's Spelling Coach Professional, including Big Thesaurus," is widely recognized as the most complete electronic language reference anywhere.

But we've never been able to find all you MacLightning users to let you know about your option to upgrade to Coach.

Lots of you did get the mes-

sage, contacted us, and paid the nominal fee to switch over. But some of you simply didn't know you had an option.

> Now you do. And all that's required is a phone call or a stamp. Simply provide us with your complete MacLightning serial number – along with a check for \$50 or your American Express® charge information and we'll send you the complete Spelling Coach Professional, in all its majestic verbosity.

> But do it before June 30th. When the old MacLightning becomes forever just a flash in the pan.



© 1989 Deneba Systems, Inc.

I'm coming in out of the rain.	
Here's my MacLightning serial number and my	

\$50 payment. Please send me my Coach (List Price \$195)

STREET ADDRESS (NO P.O. BOXES PLEASE)

NAME

CITY/STATE/ZIP

Deneba Software

3305 Northwest 74th Ave. Miami, FL 33122 Phone Orders: 1-800-622-6827 In Florida: (305) 594-6965

☐ CHECK ENCLOSED; OR ☐ CHARGE MY AMERICAN EXPRESS

CARD *

EXP DATE

SIGNATURE

MACLIGHTNING SERIAL *

All product names mentioned are trademarks of their respective holders.

Drive Safely.

Safety first.

That's the basic rule of thumb with disk drives because you can't risk crashing. And that's precisely why you should buy a Jasmine DirectDrive.™

Ranging in storage from 20MB up to 140MB, all DirectDrives have to pass the Jasmine torture test: 10 million read/write commands with stop starts at low voltages.

Equipped with Symantec™ Utilities for Macintosh, you can even recover data from a

mistakenly initialized hard drive—something nobody else can do.

Then back everything up with Microseeds' simple yet powerful Redux™ software. That's included, too.

And our true SCSI partitioning means you can allocate distinct storage "partitions" to different users, managing everything from the control panel. Yet another Jasmine exclusive.

We drive faster than the competition and offer a no-nonsense two-year limited warranty.

It's storage you can definitely afford. And given the value of your data and our safety record, you can't afford to consider anything else.

To order, just pick up the phone and give us a call. Mon.-Fri. from 8am to 6pm (Pacific Standard Time). Dial 1-800-347-3228 in the U.S., 415-282-1111 Worldwide. MasterCard, Visa, or American Express.

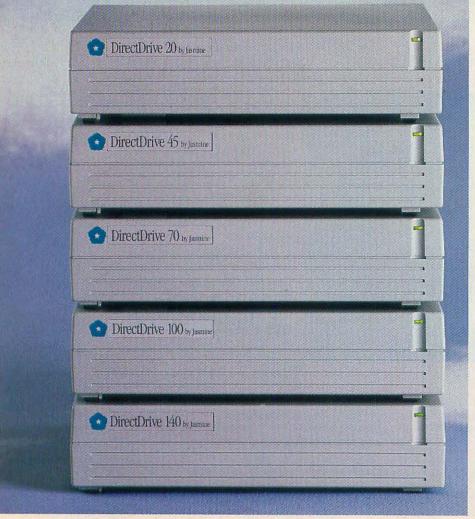
DirectDrive 20— \$549 DirectDrive 45— \$799 DirectDrive 70— \$999 DirectDrive 100— \$1249 DirectDrive 140— \$1499 Call for P.O. pricing.



Jasmine

1-800-347-3228

1740 Army Street San Francisco, CA 94124 FAX: 415-648-1625 Phone: 415-282-1111



© 1988 Jasmine Technologies, Inc. DirectDrive is a trademark of Jasmine Technologies, Inc. Symantec Utilities for Macintosh is a trademark of Microseeds. Prices subject to change.

Circle 457 on reader service card



As Long As You're Up, Get Me a Game

All work and no play makes us dull indeed, but the Mac offers an antidote.

Remember a few years back when untold numbers of serious computer users looked down their noses at the Macintosh and pronounced that it was nothing but a toy—or worse, a *yuppie computer?* Not suited to real applications, the Mac was obviously meant for those neophytes who liked to draw pictures and play games.

If you weren't there, you probably can't imagine how pervasive Mac bashing was, or how frequently Macintosh users had to defend themselves for making that choice. If you did admit to owning one of those cute little critters with the puny 128K RAM and utter lack of software, you probably avoided bumping into Lotus power users at the office water cooler.

To counter the Macintosh's youthful image, Apple Computer, many Mac enthusiasts, and even publications like this one began to emphasize more heavily a growing number and variety of serious Macintosh applications, and chose to ignore the fun stuff. I know this is true, because at *Macworld* I was among those who deliberately took part in changing the course.

As a result, games and creative applications like music generators and graphics and animation programs received little ink.

Meanwhile, of course, the Mac has become a much more powerful, expandable, serious machine, supported by megatons of useful business software. Its image has changed dramatically. Are you, however, among those who know that the Mac can still be fun? That there are lots of great programs that you can play with and learn from all at once?

I made this discovery one evening, after spending too many hours staring at Excel spreadsheets. Punchy from looking at numbers, I popped a new game called Hidden Agenda into the slot. Hidden Agenda is an interactive simulation program from Springboard, in which the player becomes the newly elected president ("Presidente Incognito") of a mythical Central American country ("Chimerica") that has just overthrown its dictator.

Four or five hours later, when I had finished playing Hidden Agenda for the third time, I realized that I had learned a good deal about what it might be like to run a Central American country. I also learned that a good educational program doesn't need to be very elegant to be effective. Though the graphics for the game are crisply designed, Hidden Agenda's real assets are its research, logic, and clearly written instructions.

The central image on the screen is the president's desk, from which you can read Chimerican newspaper reports; keep track of your decisions and meetings with members of the cabinet, the military, diplomats, bankers, church officials, labor organizers; and so on. You try to steer a political course that accomplishes the goals you think are most important for the country—and as president, you get to choose.

From a programming perspective, Hidden Agenda does nothing to advance the state of the art. Its beauty lies not in the technology, but in the content. The game's designer and writer, Jim Gasperini, really knows his subject. The cast of characters, political affiliations, and potential problems all bring to mind the news we get about various situations in Central America. If you choose to meet with the bishop he'll ask you to jail the military men allegedly responsible for rural terrorism. If the Popular Stability party member you've chosen for a cabinet post clashes with the Christian Reform party member you've chosen, you must deal with how that affects the political climate. And don't forget that you must monitor Chimerica's high infant mortality rate, as well as meet with the coffee growers and the campesinos.

After playing through the sequence you know you've had fun, but you also get the sneaking suspicion that you've been tricked into taking a college-level political science seminar on developing a stable government in a shaky region. After a couple of hours of balancing political forces from the right, left, and center while attempting to keep the economy healthy and the majority of the people happy, I really did get a deeper understanding of the Central American dilemma, Mission accomplished: the same machine I had been grinding away on provided some welcome relief, and I was ready to go back to the serious stuff.

The moral of the story is to remember that the Mac is still up for having fun if you are. And the graphics and interactive capabilities of many of the games available today are inviting and clever as well as instructive. So take a break from the usual toil of project management, databases, or spreadsheets. You have nothing to lose but your self—for a little while, anyway.

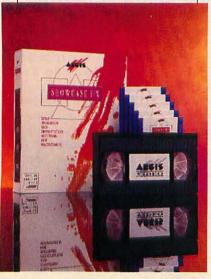


MaraThon 030 (Dove)

Put a fast running 68030 chip into your Mac II with this MaraThon accelerator board. Features a 256K byte internal data cache, 256 bytes of instruction cache, and a full 32 bit microprocessor operating at 32 MHz. Quick and easy installation. Superior workstation performance at an affordable price. (drives) \$1039.

HYPERWARE

Activision	
Business Class & Focal Point	65.
Focal Point II	125.
Reports for HyperCard	75.
Bantam	
Complete HyperCard Handbook	. 23.
Beacon Technologies	
HyperBible International Version	195.
HyperBible King James Version	159.
BrainPower	
ArchiText	182.
Bright Star Technology	
HyperAnimator	79.
HyperPress Publishing	
Script Expert	49.
Silver Screen	42.
MacroMind	
VideoWorks II HyperCard Driver	60.
MicroMaps	
HyperAtlas	64.
Power IIn	
HyperTutor	29.
Softworks, Inc.	
HyperTools #1 or #2e	a 59.
Stack Cleaner	29.
Symmetry	
HyperDA	38.
UTILITIES	
Affinity	
Tempo II	89.
Berkeley System Design, Inc.	
Stepping Out II	.52
	SHIP STAN



Beyond, Inc. MenuFonts 2 CE Software DiskTop 3.0.2 QuicKeys (macro programmer) Central Point Copy II Mac (with MacTools)20. Lasertalk 1.0 Fifth Generation FastBack PowerStation Suitcase II HJC Software, Inc. **ICOM Simulations** On Cue Kent Marsh MacSafe or NightWatchea 89. Mainstay Capture .. GOfer Olduvai ClinShare PCPC HFS Backup 3.0 Simon and Schuster Fully Powered Mac SuperMac DiskFit or SuperSpool 5.0ea 54. Sentinal 2.0

MultiScreen Video Card

(Mobius Technologies)
Increase your screen size almost three times with the NEW MultiScreen Video Card that lets you connect inexpensive 14" monitors to your Macintosh SE. You can choose from three different screen resolutions, including 72 dpi. Displays up to a full page lengthwise and works with your built-in Mac screen for additional

your built-in Mac screen for additional workspace. Plugs into SE expansion slot. Its flicker-free screen is ideal for desktop publishing! (disk drives) \$349.

Showcase F/X (Aegis Development, Inc.) Add new dimensions to business

Add new dimensions to business presentations and desktop video productions. Powerful special effects and dazzling animations allow you to apply exciting styles and colors to any font. Create animated text and slideshows. Design product information sheets, logos, and advertising layouts with unique font effects and headlines. Just the ticket for high-impact presentations with a professional look! (graphics) \$295.



Borland	
Turbo Pascal	68.
Turbo Database Mac	65.
Manx Software Systems	
Aztec C or Unitools	ea 65.
Aztec C+SDB or C+MPW .	ea 99.

Ouicken Microsoft. QuickBasic **SmethersBarnes** Prototyper Symantec COMMUNICATIONS CE Software QuickMail CompuServe CompuServe Navigator45.

DataVIZ MacLink Plus w/Cable145. FreeSoft Red Ryder 10.354. Haves Lamir Microphone II **Traveling Software** Lap-Link

PixelPaint 2.0 (SuperMac)

The first and best selling color paint program for Macintosh color systems has now been enhanced. Equipped with a new set of powerful features for graphics, desktop publishing and color prepress work. Comes with built-in Pantone color picker, color separator with screen angling, and PixelScan (new color scanning utility). Choose PixelPaint as your complete solution for color graphics. (graphics) \$209

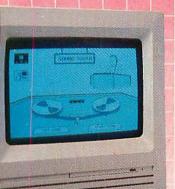


MacWarehouse technical staff and the publisher of the popular Power User's Manual have put together a great new disk of utilities desk accessories and applications. THE POWER USER'S TOOL KIT. Seventeen great programs, including a powerful word processor that you can install as a desk accessory

And its FREE with any purchase of the programs are absolutely free All of the details are explained on the disk, which is yours to keep an

FREE CATALOG

You'll also receive our brand new 1989 catalog Hundreds of new products, product reviews and updates. Plus answers to all you questions about compatibility, copy protection and features. Take a look at the MacWarehouse specials and call us with your order to receive your free catalog and THE POWER USER'S TOOL KIT.



NEW 800K Drive (Cutting Edge)

The Cutting Edge 800K disk drive's attractive styling, quet performance, and high-tech relia-bility make it our most popular floppy drive. The drive uses ASIC technology to reduce the number of parts, increasing reliability and reducing weight. Features an LED light to indicate disk access and a hinged door over the disk insertion slot to keep the mechanism clean. Uses standard Apple formatting routines and supports the Macintosh's standard software eject features. Features manual eject mechanism also. One year warranty. (disk drives) \$175.



MacWAREHOUSE CATALOG 1690 Oak Street

P.O. Box 1579 Lakewood, NJ 08701

I don't need to order right now, but please RUSH me my FREE copy of the brand new MacWarehouse Catalog.

NAME ADDRESS

APT#

CITY

STATE

SuperPaint 2.0 (Silicon Beach Software) Get the freedom of Paint and the precision of Draw in a single program! More than 25 new features including calligraphy brushes and nizable arrows. Mix fonts, styles sizes. Rotate text and objects at for giving clip art a professional

Macintosh SE

Monta-mine

FoxBase+/Mac 1.1 (Fox Software)

SUPERPAINT

The most talked about relational database manager for the Mac. Provides extraordinary execution speed, an elegant Mac Interface for ease-of-use and complete dBASE compatibility for frans ferring applications from the PC. Form generator can create any data input/out-put form imaginable. Application generator reduces program development time for beginners and experts alike. Runs on SE, Plus, or Mac II with 1MB of memory. (database) \$208.



CHOOSE MacWAREHOUSE.

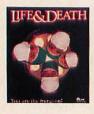
For price, quality and service you won't find a better source for your Mac needs. If you don't see it here, give us a call. Most likely we'll have it in stock. Our sales representatives are here

MadVAREHOUSE 1-800-255-6227

(1-800-ALL MACS) Inquiries: 201-367-0440 Canada: 800-255-6447 FAX # 201-905-9279 MONDAY THRU FRIDAY 8A.M. TO 11 P.M. (Eastern Time) SATURDAY 8 A.M. TO 8 P.M. (Eastern Time) NOW OPEN SUNDAYS!

8 A.M. to 8 P.M. (Eastern Time)





Life & Death

You are the surgeon! Test your skill with the scalpel. The first interactive medical movie for the Mac. Read charts, order X-Rays and monitor EKG. The patient's life is in your hands. Gloves and mask included. (entertainment) \$34.



Linkword Languages Learn a foreign language in just 10 hours, 400 word vocabulary that's ideal for travel and business. An audio tape lets you hear the correct pronunciation. It's easy and enjoyable. French, Spanish or German. (educational) Each \$25.



Images w/Impact **Business** 1

New Business Clip Art. Create professional presentations with over 150 sharp, contempo-rary PostScript Images. Contains computers, occupational and public symbols and much more! (graphics) \$69.



Script Expert
Programming for Hyper-card by the author of HyperTalk Programming. Script Expert knows the rules for every command, function, and message in Hypertalk. Requires no programming experience. (hyperware) \$49.

DESKTOP PUBLISHING PRODUCTS

ACE-Textures, Fill, and Patterns ... 168. Aldus DTP Advisor 47. Letraset Image Studio or Ready, Set, Go! 279. Read-Itl 2.0 (OCR)199. Quark Xpress or QuarkStyleCall. Solutions SuperGlue 1.05 52. Springboard Springboard Publisher109.

NETWORKING PRODUCTS

Connect Inc. MacNet



Farallon Timbuktu 2.0.1	Call
SuperMac	
Network DiskFit	199.
TOPS	
TOPS 2.1	149.
FONTS	
Adobe	
Fonts (All Avail.)	Call.
Altsys	
Fontastic Plus 2.0	54.
Letraset	
LetraStudio	
LetraFonts (various)	ea 59.

CAD/CAM Graphsoft MiniCad Plus **Innovative Data** MacDraft Dreams Micro CAD/CAM MGMStation (professional CAD) ... Call. FINANCIAL AND

Olduvai

ArtFonts .

ACCOUNTING SOFTWARE

ı	OC. I WILL	
١	Aatrix Payroll 3.5	
	Payroll 3.5	99.
ı	Payroll PLUS15	59.
	Bedford	
١	Simply Accounting2	9.
	Chang Labs	-
ı	Rags to Riches 3 pk 3.1	39.
ı	Intuit	200
ı	Quicken	33.
1		

Canvas 2.0 (Deneba)

This revolutionary upgrade sets the standard for drawing programs by blending powerful drawing capabilities with convenient easy-to-use paint features. Features include autotrace. multi-point Bezier curves, unlimited layers, 16.7 million colors for 24-bit Mac II support, hairlines to 1/1000th of an inch, improved precision to 64,000 dpi, PostScript gray scales in onedegree increments, TIFF and bitmap editing, and zoom capacity ranging from 3% to 3,000%. (graphics) \$159.



LYNX Turbo Trackball (LYNX Computer Products, Inc.) Let aerospace technology give

you precise fingertip control over cursor movement in less than half the space. Desktop publishing CAD/CAM drawing and graphics, as well as standard cursor movements. are easily accomplished. Needs no cleaning, gives you automatic accelerating and eliminates running off a mouseway. Get twice the speed, twice the resolution in less than half the space. Lifetime Manufacturer Warranty. (input/output) \$69.

MECA	
Managing Your Money	128.
Monogram	
Business Sense	279.
Softview	
MacInTax Federal '88	
TaxView Planner	64.
Survivor	
MacMoney 3.02	62.
STATISTICAL ANA	VIVEIC
	4T 1212
Abacus Concepts	
StatView II	
Ctat View CE . Craphics	000

Monogram	
Business Sense	279.
Softview	
MacInTax Federal '88	69.
TaxView Planner	
Survivor	
MacMoney 3.02	62.
STATISTICAL ANAL	YSIS
Abacus Concepts	THE REAL PROPERTY.
StatView II	349.
StatView SE+Graphics	
BrainPower	
StatView 512+ (requires 512k)	175.

D2 Software	
MacSpin 2.0	189.
Odesta	
Data Desk Professional	289.
Paracomp	
Milo	169.
Select Micro Systems, Inc.	
Exstatix	219.
Software for Recognition Tech	
MacEqn	
MILEIC AND COUN	D

MUSIC AND SOUND

Aitecn
MIDI Interface59.
MIDI Basic30.
Coda
MacDrums32.
Perceive52.
Electronic Arts
Deluxe Music Construction 2.5 84.
Farallon Computing
MacRecorder (records sound) 139.
Great Wave
ConcertWare + MIDI 4.079.
Impulse
Audio Digitizer w/SoundWave 145.
Intelligent Music
OvalTune95.
Opcode Systems
Music Mouse
Passport Designs Master Tracks Pro
NoteWriter169.
ED/IOATIONAL /

EDUCATIONAL/ PERSONAL

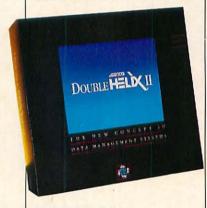
Artwork Linkword Languages (Sp, Fr, Ger)ea 25.

2400II Internal Modem (EPIC Technology, Inc.)
This internal modem for

the Mac II can tap into any database, electronic mail or service bureau. Features auto dial/auto answer, call progress monitoring, software controlled speaker, choice of tone or pulse dialing and redial on busy. It's voice/data switchable and has a self-test mode. Comeswith a 5 Year Manufacturers Warranty. (drives) \$315.



DATABASE SOFTV	VARE
Acius	
4th Dimension	469.
Ashton-Tate	
dBase Mac	295.
Porland	
Reflex Plus	189.
Chang Labs	
Chang Labs	229.
Claris	
FileMaker II	237.
Fox Software	
FoxBASE+/Mac 1.1	208.
Odesta	
Double Helix II	339.
GeoQuery	199.
Software Discoveries	-
Record Holder Plus	45.
BUSINESS SOFTW	ARE
Access Technology	
Access Technology Trapeze 2.1	155.
Ashton-Tate	
Full Impact	249.
BreakThrough Productions	
Market Master	185.
Market Master R/A	245.
Claris	
MacProject II	395.
Cognition Technology MacSMARTS 3.2	
	135.
Cricket	440
Cricket Graph	114
Cricket Presents	000



Double Helix II (Odesta)

Connect the icons to create a customized database! Runs and prints faster then the Old Helix. It prevents data loss during a system crash or power failture. The posting functions are easy to use. Object Manager keeps track of all your icons. Date and time icons are more flexible. Received MacUser Award for Best General Business Software - Europe 1988. No other database has anything quite like it! (database) \$339.

MicroPlanning International	
MicroPlanner Plus	385.
Microsoft	
Excel 1.5	259.
PowerPoint 2.1	
Works 2.0	
Nolo Press	
For the Record	29.
WillMaker	34
North Edge Software	
Timeslips III	117
Shana Enterprises	
FastForms! Construction Kit	29
Softview	
FormSet	55
MacInUse	
Spectrum Digital TrueForm	260
	209.
Symantec More II	225
More II	DO.
WORD PROCESSO	KO
AND OUTLINERS	S
THID OUTLINE	

FullWrite Professional269.

Ashton-Tate



Claris	
MacWrite 5.0	102.
Microsoft	
Word 4 (updated word processor)	.249.
Write 1.0	79.
Niles & Associates	
End Note	82.
Paragon	
Qued/M	109.
Symmetry	
Acta Advantage w/DA	69.
T/Maker	
WriteNow 2.0	109.
WordPerfect Corp. WordPerfect	105
wordPeriect	185.
SPELLING CHECKE	RS
Aegis	
Doug Clapp's Word Tools	42.
A.L.P.	44-
MacProof 3.0	115.

SPELLING CHECKE	RS
Aegis	
Doug Clapp's Word Tools	42
A.L.P. MacProof 3.0	115
Deneha Software	
Bigthesaurus	54
Spelling Coach Pro	Call
Microlytics	
Word Finder (synonym finder)	33
Sensible Software BookEnds	Call
Sensible Grammar	Gall
Washing Callering	
Spellswell 2.0	45
GRAPHICS	
3G Graphics	
Images w/Impact	-
Graphics & Symbols 1	59

45
59
69
70
79 289
289
295
349

VISA and MASTERCARD accepted. No surcharge.

Your credit card will not be charged until your order is shipped.

If we must ship a partial order, we pay the freight on the remaining portion.

All U.S. shipments are insured at no extra charge.

C.O.D. orders accepted (add \$6.00 including shipping) — \$1,000 maximum. Cash, money order, or cashier's check.

Corporate purchase orders accepted subject to credit approval.

All products are covered by a 120 day limited warranty.

C.T residents add 7.5% sales tax. NJ residents add 6.0% sales tax.

SHIPPING

All orders and \$5.00 per order. We ship Airborne Express evernight unless.

All orders add \$3.00 per order. We ship Airborne Express overnight unless UPS ground delivers overnight. (Some rural areas require an extra day.) Orders placed by 5:00 pm Eastern time (weekdays) for "in stock" items ship same day (barring system failure, etc.) for overnight delivery. C.O.D. orders ship via UPS (Blue Label if you are more than 2 days from us via UPS ground). Charge is \$6 including shipping.
Alaska, Hawaii, outside continental U.S., APO/FPO call 201-367-0440 for information.

*Detective software replaced immediately. Hardware replaced or repaired at our discretion I'm Kerry, call me at: 1-800-255-622

(1-800-ALL-MACS)
Inquiries: 201-367-0440 Canada: 800-255-6447 FA FAX # 201-905-9279

Macvariations

1690 Oak Street, P.O. Box 1579, Lakewood, NJ 08701
MONDAY THRU FRIDAY 8 A.M.TO 11 P.M. (Eastern Time)
SATURDAY 8 A.M. 10 8 P.M. (Eastern Time)
NOW OPEN SUNDAYS! 8 A.M. to 8 P.M. (Eastern Time) Cirrus Drive Kits (La Cie Ltd) With these kits and

your choice of a 3 1/2" embedded SCSI drive, you can put together your own internal, or external drive for any SCSI-equipped Mac. Internal kits come with a universal bracket; external kits come with the award-winning Cirrus case and a Cordura Carrying bag. Kits come with SilverLining and SilverServer software. (disk drives) CALL.

Broderbund
Drawing Table79.
PosterMaker Plus36.
TypeStylerCall.
VideoWorks II175.
CE Software
CalendarMaker27.
Claris
MacDraw II 2.0325.
MacPaint 2.0102.
Cricket
Cricket Draw169.
Cricket Paint
Pict-O-Graph (color on the Mac II) 99.
Deneha
Canvas 2.0 159.
Droam Maker
Cliptures, Business Images97.
MacGallery
Flectronic Arts
Studio/8319.
Microlllusions
Photon Paint179.
MicroMane
MacAtlas Pro (MacDraw format) 129.
NuCaustion
NuPaint99.
Olduvai
Art Clips69.
Paracomp
Swivel 3D265.
Silicon Beach
Digital Darkroom or Super 3D Call. SuperPaint 2.0
SuperPaint 2.0129.
Solutions
Curator (graphics management)79.
Cumanhiaa
PixelPaint 2.0209.
Symmetry
PictureBase & WetPaint95.
T/Maker
ClickArt EPS Illustrations
Zedcor
Deskpaint 2.069.
charge. MWD9

Stiver Screen
Organize your video tape
collection. Instantly cross
references up to 2500 actors and actresses. Lists more than 650 movies with complete descriptions, ratings and running times. (hyperware) \$42.



Managing Your Money A fully integrated software program addressing every aspect of personal and small business finance. Write and print checks, set up a personal budget, estimate your taxes and more. (finance) \$128.



ProModem 2400M

Get a 2400 baud modem, cable and one of the best communications software all in one package! Its platinum case matches your Mac and looks like it belongs on your desk. Two Year Manufacturer Warranty. (drives) \$199.

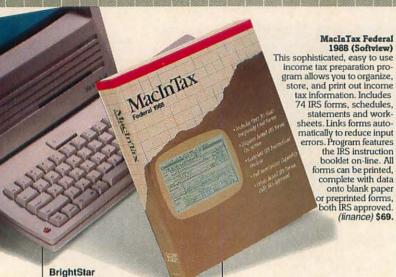


Rags to Riches 3 Pak 3.1 Keep your books in proper style with Rags to Riches, a well-integrated accounting system (Ledger, Payables and Receivables). New improved reporting capabilities, especially in the choice of fonts, styles and arrangement report elements. (accounting) \$289.



© Copyright 1988 MicroWarehouse, Inc. MacWAREHOUSE™ is a division of MicroWarehouse, Inc. MacWAREHOUSE™ and MicroWarehouse are trademarks of MicroWarehouse, Inc. Item availability and price subject to change without notice.

DIMERRICATION OF THE PROPERTY OF THE PROPERTY



	Simon & Schuster Star Trek:Kobayashi Alternative Spectrum HoloByte	24
ı	Falcon 2.0	32
۱	PT109 or Gatoea.	
	Solitare Royale or Tetrisea The Software Toolworks	20
	Chessmaster 2100	32
	Life & Death	34
	The Hunt for Red October	29
	DISK DRIVES/	
	MEMORY UPGRADES	3
	1 MEG SIMMS	all
	AST	

Mac286 Co-Processor (Mac II) 1079. CMS TapeStack 60 MegCall.

Microsoft Wort



FastBack

Now you can take all your key files on your next business trip! FastBack is a high speed backup program that copies data from hard disk to standard floppies at a rate of 1Mb per minute (or better!). Also features Error Correction Codes. (utilities) \$54.



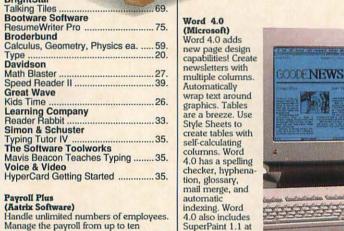
(Microlytics)

The high speed text-retrieval ac-cessory from Microlytics. Summon GOfer with one keystroke to search out information in your disk files. Enter one or two words and have a document at your fingertips within seconds! Works with almost any file. (utilities) \$44.



C.A.T. 2.0

Automate activities with this rela-tional database designed to manage Contacts, Activities and Time. Plan activities, do forecasting or scheduling for the future. Import and share data among multiple users. Database, mailmerge/text and calendar functions in one easy to use program. (database) \$229.



SuperPaint 1.1 at

(word processing) \$249.

no extra charge.



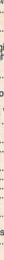


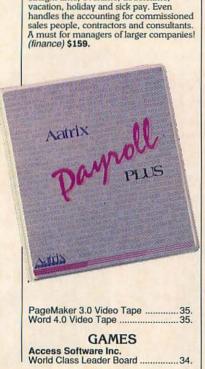
Arkanoid (Discovery Software) The #1 Coin-Op Game has come home, offering the breathtaking

animation, digitized sound and dazzling game play you've been seeking! Features Multiple Levels, Arcade High-Score Table, Variable Skill levels and more! Guaranteed to push you to the limit....and beyond! (entertainment) \$27.



ARKANOID





different income sources or rates. It prints

form 1099 and writes miscellaneous checks. You can itemize and accumulate straight time, overtime, doubletime,

The BIG Thesaurus Contains over 100,000 root words from the Merriam-Webster Collegiate Thesaurus, Inserts replacement words directly into your document. Compatible with Multifinder and Hypercard. (spelling) \$53.



BASF 3.5" Double Sided Double Density High capacity diskettes with no capacity for error. Every bit, every bite on every track of each BASF 3.5" Diskette is certified 100% error free. Warranted for life. (media) \$17.



ALTECH MIDI Interface Have your Mac playing music in no time. Simply connect the interface to your printer or

modem port and you are ready to hook up your favorite MIDI synthesizer. Complete with cables and program disk. Works with all Mac MIDI software. Adapter required for Mac 128/512. (music) \$59.



Spelling Coach

Finding 1

Professional Complete on-line spelling and reference system includes Merriam-Webster's 158,000 word dictionary, 245,000 synonym thesaurus, hyphenation, and a dictionary with 85,000 real definitions! (spelling) Call.

Everex	
EMAC 20D (hard drive)	520.
EMAC 20D Deluxe (O footprint)	585.
EMAC 40D Deluxe (O footprint)	995.
EMAC 60T (tape backup)	895.
EMAC FS-102	
Impact Hard Drives	Call.



MAC - 101 Keyboard (Data Desk)
Features 101 keys including a
numeric keypad, a separate T-shaped
cursor keypad, Cancel Key, Option
and Command keys at both ends,
definable function keys, plus scrolling, page control, and zooming keys. Comes with free macro software and manufacturer's two

year warranty. (input/output) 14:	5.
La Cie Ltd.	
3.5 Mounting Kit w/SilverServer	99.
Cirrus Drive Kits	Call.
MiniScribe	
20Mb Raw Int. Drive Kit	379.
45Mb Raw Int. Drive Kit	
Mobius	
MultiScreen Video Card	349
PCPC	0 10.
MacBottom HD21 (SCSI)	659
MacBottom HD32 (SCSI)	699
MacBottom HD32 (SCSI) MacBottom HD45 (SCSI)	850
MacBottoms w/Modem	Call
Peripheral Land, Inc.	Oan.
Infinity Turbo 40 Meg	1200
UniMac	1233.
3.5 or 5.25 Int. Mounting Kits	Call
Ctonuero	can.
Storware	09.

MODEMS

Abaton

InterFax12/48	320
Best Data Products	.020.
SmartOne 2400/1200 with cable	
and software	160
EPIC Technology	. 105.
2400II Internal Modem	215
Everex	. 515.
EMAC 2400	225
Haves	. 225.
Smartmodem 1200	200
Smartmodem 2400	
Smartmodem 9600 (V series)	985
Migent	. 505.
Pocket Modem (ext. 300/1200 baud	4)115
Prometheus	2)110.
Promodem 2400	309
Promodem 2400M	199
Shiva	
NetModem 1200	359
Supra	.000.
Supra Modem 2400	149
US Robotics	
Courier Modems	.Call.
	BEEN STREET
BLANK MEDIA	
B.A.S.F.	

 Sony
 19.

 DS/DD (box of 10)
 19.

 SS/DD (box of 10)
 13.

INPUT/OUTPUT

Cutting Edge CE-105 ADB Keyboard125.

DeskPaint 2.0 and DeskDraw (Zedcor)

The Mac's most powerful paint DA now bundled with the Mac's most powerful draw DAincludes Auto-Trace, Browse and on-line help. MacPaint,

compatible. (graphics) \$69. ZBasic 5.0 (Zedcor) New and improved version - 256 colors, all toolbox routines and MS basic conversion program now bundled with The Program Generator, a draw-like editor that takes the grunt work out of writing REAL Macintosh

applications (language) \$99. DataDesk Mac 101 Keyboards145. Kensington New Turbo Mouse119. Kurta IS/ADB Tablet259. Cordless 4 Button Cursor65.

LYNX Computer Turbo Trackball (512/Plus or Se/II) .. 69. Mouse Systems A+ Mouse (512/Plus or SE/II)Call. New Image



Impact Hard Drives (Everex)

The EMAC Impact Hard Drive series free teams. Impact had blive series high speed 19 ms performance, external SCSI addressing, external termination, whisper quiet operation and a compact, slim-line chassis 2 1/2 x 6 x 10 1/2 in.. (disk drives) EMAC Impact 60 MB or EMAC Impact 40MB Pfus. CALL. Summagraphics Bit Pad Plus ThunderWare LightningScan ThunderScan 5.0189.

ACCESSORIES

ACCESSURIES	
Amaray	
MediMate Flex Pac	12.
Computer Friends, Inc.	
MacInker (IW & IW II)	41.
Ergotron	
MacTilt or MacTilt SE	68.
Mouse Cleaner 360	15.
/O Designs	
mageWare II Carrying Case	49.
mageWriter LQ Ribbon	.Call.
W II Ribbons-Black or Color	Call.
Macinware Plus Carrying Case	64.
Macinware SE Carrying Case	75.
Kensington	
Anti-Glare Filter	33.
Apple Security Kit	34.
Viac II Stand w/Cable Kit	65.
MasterPiece Mac II	. 105.
Modem/FAX Protector 20	25.
PowerTree SurgeProtectors	.Call.
System Saver	64.
Mobius Products	1
Fanny Mac QT	., 65.
SE Silencer	39.
Omnium Corporation	100
Mac Desktop Workstation	75.
Orange Micro	
Grappler L/Q or LS	Call.
Targus, Ltd.	00
Deluxe Plus/SE-XKB Case (black)	69.
mageWriter II Case (black)	49.
Mac Plus/SE Case (black)	59.

I'm Kerry, call me at:

MadVAREHOUSE 1-800-255-6227

OVERNIGHT DELIVERY: ONLY \$3.

If you're already a MacWarehouse customer you know that nobody, beats our service. Our helpful telephone staff is standing by, seven days a week. Place your order by 5:00 pm Eastern time (weekdays) and it's processed immediately for overnight delivery. Call us toll free right now.



Circle 78 on reader service card



Never before has this level of Reliability and Durability been available in floppy disks. Introducing the new RD Series from Maxell. Twice the durability of the disks you're now using. Twice the resistance to dust and dirt. And the RD Series is ten times more reliable than conventional floppy disks. The Gold Standard has always meant maximum safety for your data. Now it means even more.





Introducing the First Mac Clone

Is this Macintosh work-alike too good to be true?

by Steven Levy

The daunting words "it can't be done" are sometimes perversely provocative. All too often that forbidding phrase generates a chorus of echoes and becomes a law unto itself. At times, though, people regard those words as a gauntlet cast at their feet, a glove flicked sharply against their cheek, a rebuke that must be addressed. It can be done, they vow. And they do not slumber soundly until they do it: split the atom, circumnavigate the globe, cure polio, harness electricity, shrink a mainframe computer to one on a personal scale, or, in this case, manufacture a low-cost, lawsuit-proof, betterthan-the-original, Macintosh work-alike.

Yes. A new era of Macintosh computing has begun, and this nascent golden age is occurring without any assistance from Apple Computer.

Getting the Scoop

Surprised? Not nearly as much as I was recently when I received, in short order, not one but two overnight dispatches from a well-known PR firm. Both requested my presence at a New York hotel room at a certain date and hour, and both were stuffed with those onerous nondisclosure forms binding me to complete silence about what I had seen until a time my handlers deemed propitious. I sent the forms back with a note explaining that I could not take a vow of silence until I had some idea of what I wasn't supposed to talk about.

Steven Levy is a Macworld columnist and the author of The Unicorn's Secret: Murder in the Age of Aquarius (Prentice-Hall, 1988).



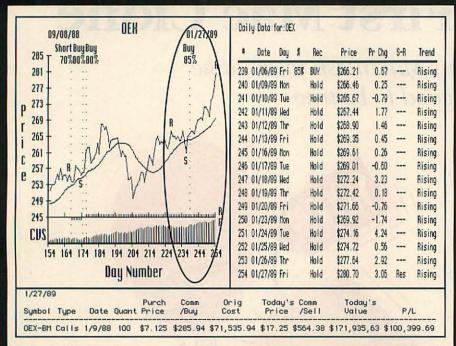
Then a big cheese from the firm called, asking me to lunch. Fine, I said, so long as I could name the place. So at Grand Central Station's Oyster Bar I learned that mysterious industry mavens had designated this column as the exclusive source of information on their new product—but only if I would sign the forms and keep my mouth shut during the period between when I saw the product and the publication date of our April issue.

Knowing that this PR firm had extensive dealings with a certain Northwest software concern, I tried to ferret out the information with no obligation on my part. "What's Microsoft up to?" I asked. "Another stab at desktop publishing?"

"It's not Microsoft," the big cheese answered. "Well, maybe it is. They're involved. But it's not their product. You're not even close."

Then the power luncher glanced nervously around us. "Look, you idiot,"

Results: Winning Trades \$100,399.69 profit in 3 weeks.



If you didn't make big profits during this rally, you need our software!

The Right Time™ computerized trading system was developed by an expert portfolio manager for his own personal use. Over the last nine years of <u>in-market</u> use the software has been perfected and made easy to use. Now it's available for any smart trader who wants to make quick profits from quick decisions.

Not only is The Right Time™ the best decision support system ever devised for traders, it's the <u>only</u> software that analyzes volume/price, support/demand, and global market trends - all at the same time.

Amazingly Precise.

The Right Time™ programs run on IBM (and compatible), Apple II and Macintosh personal computers. The software is easy to use, amazingly precise, and very, very clear in its signals.

It's also fast. You can update all of your stocks, commodities, indexes or mutual funds from Dow Jones in less than five minutes per day.

What's more, you can play "What If" games with individual stocks, commodities, indexes, funds or options with results in about one second.

Results: Winning Trades.

There are seven Right Time™ programs available to help you make the right decisions at the right time.

Stock Program: "The program is amazing. Profitable trades have developed out of

nowhere!" M.C., brokerage firm vice president.

Index Program: "Computer whiz finds program for success. This program really works." A.G. financial columnist.

Futures Program: "Very profitable with four out of five winners. Paid for itself the first trade." B.L., investment advisor.

Mutual Funds Program: "Accurately picked my last seven profitable trades. I couldn't trade without it." L.S., individual investor.

Stock Program/Long Term: "Exactly what I've been waiting for from T.B.S.P.. Perfect for our more conservative clients." G.M., stockbroker.

For More Information.

Call (213) 312-0154 for our free twelve page brochure. Each program costs \$449, any two \$699, any three \$999, any four \$1299 or all five for \$1499. We also have working demos for just \$49 (each) - includes manual.

Now Available - The Right Time-Day Trading Program/Futures and The Right Time-Day Trading Program/Indexes priced at \$549 each or both for \$899.



Future results may vary

All programs not available on all computers.

Circle 135 on reader service card

The Iconoclast

she whispered testily, "I'm giving you an exclusive on the Macintosh clone! Are you going to sign or should we call Dvorak?"

I signed.

Gates of Eden

A week later I was knocking on the door of a Plaza suite. It was opened by none other than Microsoft chairman Bill Gates.

"Hi, come on in," he said; as usual he was bouncing around with nervous, almost impatient creative energy. Spread around the suite were a bunch of guys in black suits. I mentioned that I didn't know any of those fellows and Gates shrugged. "It's not superimportant for you to know everyone here. These two are lawyers," he motioned. "This one's a security guard. A couple are hardware guys from the manufacturer."

"Who is the manufacturer?" I asked.

"We'll get to that," Gates said. "First, look at this." He led me to a desk covered with a white sheet. On a signal from Gates, one of the suited men pulled the sheet. There stood a metallic-blue piece of technology, the size of a MacBottom hard disk but perhaps twice as high. It had a floppy disk slot on the right. On the left, where a logo might be, someone had stuck a piece of first-aid tape, but as I reached for it the security guard caught my hand. (I knew he was a guard thanks to his aviator sunglasses.)

"All in good time," said Gates, rummaging around in a large box. He pulled out a sleek, one-button mouse, which he plugged into the right side of the machine. "There's a slot on the left side, too, for southpaws," he noted. Then he pulled out a keyboard that looked like the deluxe Apple keyboard—fondly dubbed by its adherents "the barge"—but, thankfully, less wide. "ADB-compatible, of course," Gates said. "Apple keyboards work off the shelf with this machine. You won't use Apple's, though—we don't make you pay extra for ours."

He reached into the box and pulled out a compact monitor with a 12-inch

Our new Mac II modem has great inner strength.



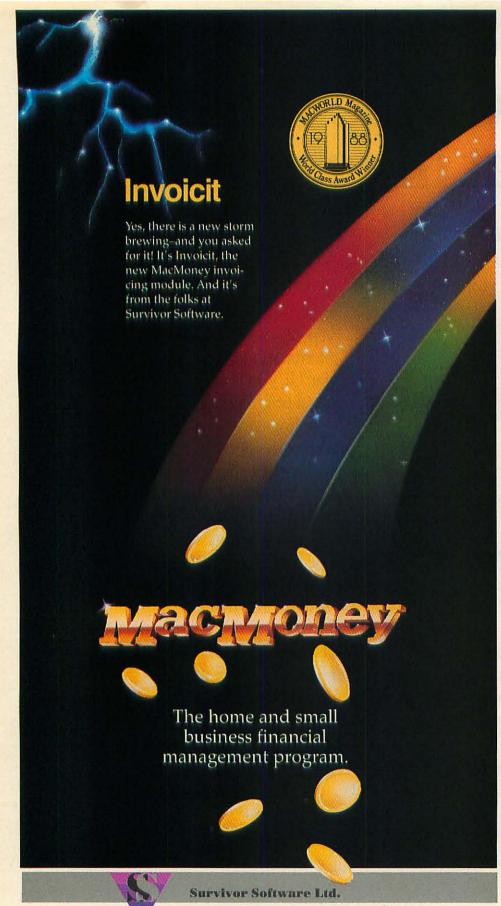
Plus, the Mac2400E supports both X.PC and MNP Level 5 error correction protocols. So you can rest assured that the integrity of your data won't be dimmed.

telephone bills.

In the unlikely event the Mac2400E doesn't perform, it's covered by our free, five-year warranty. However, before it comes to that, just call our 800 Help Line. Ven-Tel's technical staff can probably shine a little light on the problem and get you going again quickly.

So don't just put any modem in your Mac II. Go with the one that outshines all the rest.

YOUR FUTURE IS ON THE LINE



We'll send you a bibliography of our reviews and more information about MacMoney, Just call or write. Address written requests to 'Reviews', Survivor Software Ltd., Suite 450, 11222 LaCienega Blvd., Inglewood, CA 90304. Phone (213) 410-9527. List price \$119.95 (MacMoney), \$79.95 (Invoicit). Hardware: Macintosh 512KE, XL, Plus, SE & II.

Circle 112 on reader service card

The Iconoclast

display. He placed it on the main unit, then grabbed a cord from the box and plugged the monitor into the back of the unit. He typed something on the keyboard—"personalized password," he noted—and the screen came to life.

It was a very sharp monochrome display of almost cinematic quality. It said "Welcome to Apple-Killer."

Gates flushed, then smiled sheepishly. A couple of the suits—obviously, the lawyers—began to make choking noises. "Well, of course that's not what you'll see in the release version," Gates admitted. "I think one of our programmers got a little rambunctious." By then we had heard the familiar hard-disk whirr, and the screen showed the familiar Macintosh desktop—complete with menu bar, folders, and Trash Can.

Legal Matters

"How can you get away with that?" I demanded. "That's exactly the Mac interface!"

"Let me explain what's in here," Gates said, "Just as companies have managed to make work-alike versions of IBM's PC-DOS, our programmers, on contract from the manufacturer, have created a ROM that acts just like the Macintosh version. We were careful not to use any programmers who had ever worked with the Mac. It was supertough finding hackers who had never cracked open Inside Macintosh, but we finally figured out where to find them—they worked for certain Fortune 100 companies that forbade their programmers to go near Apple products. We lured these guys away and they've been working for years to make sure this machine acts just like a Macintosh does when it sees Macintosh software. We don't run into legal trouble because the software is Apple software the System, the Finder, and so on. We don't include that with the computer, but the users will get it from the applications they buy, or they'll buy it from Apple in those upgrade kits they sell for \$50 and distribute to user groups."

"That's ingenious," I conceded. "But what happens if Apple changes its ROM chips?"

The #1 SQL Database. ORACLE for Macintosh. Only \$199.

The number-one database from the numberone database company is now available for the number-one user environment. Introducing ORACLE for Macintosh. From HyperCard or your C program, ORACLE will give your Macintosh its first SQL database—for only \$199*. Better yet, you can give your Macintosh all the data from all your computers for only \$999.

MAINFRAME POWER, \$199

The ORACLE® relational database management system is 100% SQL, the industry standard data-manipulation language first introduced by Oracle in 1979. It has made Oracle Corporation the world's largest database company. Now, with ORACLE for Macintosh, the first and only SQL for Macintosh, the same database runs on every computer in your organization. Licensed especially for developers at \$199, it's the bargain of the century.

OR THE WHOLE MAINFRAME, JUST \$999.

Once you see the power of ORACLE for Macintosh, we think you'll want all the data on all the computers. ORACLE for Macintosh, with transparent access to all your computers. Over all major networks. This means your HyperCard applications will be able to access existing ORACLE PC, mini and mainframe databases



full networking and licensed for general use, is

only \$999. Data on all your other computers will be as accessible as the data on your Macintosh, How?

ORACLE's SQL*Star connectivity architecture gives your HyperCard application

as well as other SQL-based DBMS products such as IBM's DB2 and SQL/DS.

Isn't it about time you merged the numberone database with the number-one user interface to get all the data in your enterprise? Call today. Or fill out and send the attached coupon.



		^		1	
		/− \			
COMPATI	RII ITY . P	ORTARI	ITY . C	ONNEC	TARILITY

Call 1-800-ORACLE1, ext. 7802 today.

Dear Oracle Macintosh Team 20 Davis Drive, Belmont, CA 94002 I-want to give my Macintosh ORACLE. Enclosed is my ☐ check ☐ VISA ☐ MC ☐ AmEX credit card authorization for:

\$		twork vers	developers at 8 sion for \$999. (
\$	Please add ap	Please add appropriate sales tax.						
5	Total (Price v	Total (Price valid in US only)						
Name	With Bridge		Title					
Company _				-				
Street (no P	O boxes, please)_		12-11-11					
City		State	Zip					
Telephone .	Andrew Co.	A POST						
Credit Card	Number (if applie	cable)						
Credit Card	Expiration Date	mile						

*Licensed only for developers. Prices valid in US only. Requires Macintosh Plus, SB or II with 2 Megabytes of RAM, 5 Megabytes hard disk space, floppy disk drive, and HyperCard 1.2. Includes 30-day installation support, ORACIE database, Hyper'Sql (HyperCard Interface), SQL*Plus, Pro*C, OCI, Database Ulitlities, System Stackware and Example Stackware. Full networking version is 1999. Copyright © 1988 by Oracle Corporation. ORACLE and SQL*Plus are registered trademarks of Oracle. HyperCard and Macintosh are trademarks of Oracle. TRBM



Circle 238 on reader service card

This is two of the best computers on the market.



It's a Macintosh, of course. But it's also a VAX. Thanks to a family of products from White Pine Software, Macintosh and VAX computers can communicate. These include emulators that allow the Macintosh to appear to a VAX exactly like a DEC terminal. And Reggie, which

converts Macintosh graphics into DEC formats (ReGIS and SIXEL) for use by VAX applications or output devices. And VMacS, which allows users to store and manage Macintosh files on the VAX's hard disks and tape drives.

For more information, call or write: White Pine Software, 94 Route 101A, PO Box 1108, Amherst, NH 03031, (603) 886-9050.

Circle 307 on reader service card

The Iconoclast

"Well, Apple can't change them too much, or it makes all its current computers obsolete. But considering how Apple loves to reorganize, we figure that's inevitable anyway. Unlike all those Macintoshes, though, our computer won't require dealer servicing to put in a new ROM. We'll supply a new one and the owner can just snap open the case and replace the chip."

I paused for a moment, puzzled. Snap open the case?

Gates was way ahead of me. He shut the machine off, moved the monitor, and unsnapped something in the back of the computer. The case opened, and all the innards were revealed.

"We used a lot of VLSI to keep the size down," Gates said, launching an inspection of the electronics. "This is that snap-on ROM I mentioned. Oh yeah, we have Works on this ROM chip here, and as soon as it's ready—real soon now we'll put Word 4.0 in, too. Here are the memory chips-we come with 4 megabytes, standard. Here's the 68030 chipincidentally, this machine runs about twice as fast as a Mac IIx. And this is a one-third-height hard disk, 60 megs. Here's a slot for a card, though you probably won't need one-we've built in a 2400-baud modem. And this chip here allows you to send or receive directly from fax machines. See, here's the fax connector in the back, right next to the built-in MIDI port."

He sighed. "Actually it was a disappointment that we didn't have a 9600-baud modem and cellular telephone technology. But the manufacturer had a mandate to keep the price, with monitor, below \$1000. We just couldn't include the modem and keep the price down."

A Dream Price

"Wait a minute," I said. "Are you telling me the configuration I'm looking at—that works like a Macintosh, but with a more powerful chip, more memory, fax technology, and a built-in modem—costs a thousand dollars?"

"Oh no," Gates said, "not this configuration. This configuration is \$800. The \$1000 version comes with *that.*" One of

WHITE PINE

the suits carried over a slightly bulkier monitor, which Gates plugged into the back of the machine. When he turned the unit on, the Apple-Killer screen came up again-only this time, in crisp, bright

I was stunned. "How could you do this?"

"Basically, our profit margins are lower. And we shopped wisely. For instance, take the memory chips. You'd think it would be hard to get plenty of DRAM chips at a low cost. But we just called up the suppliers that Steve Jobs lined up for his Next machine. Jobs's machine was so late that the suppliers were sitting with loads of chips, and they almost begged us to take the things off their hands."

I was speechless.

"I have to admit that even with the price like this, we're worried," said Gates. "We might be wrong-price might not be a factor at all. Look what's happening out there—right now you can buy a Mac Plus for a street price of about \$1000 less than a Mac SE. Now everybody knows that there's almost no difference to the user between a Plus and an SE-yet people keep buying SEs! Even after Apple got greedy and raised the price.

"Maybe people like to get ripped off when they buy Apple computers. It's something we've had to think about. Yet the company that commissioned us to design this thing has studied the clone phenomenon very carefully, and they conclude that there will be a market for a superior Macintosh work-alike at a significantly lower cost."

Am I Blue

I couldn't stand the suspense. "What is this company?"

Gates smiled and said nothing. The men in suits smiled smugly. Suddenly I lurched for the machine, grabbing at the piece of tape covering the logo. One of the suits tried to stop me but I had

(continues)

INSPIRATION"-Diagraming and **Outlining** to Communicate Ideas and Information.

- · Capture ideas quickly in graphic or outline form.
- · Organize and refine information easily and efficiently.

- Communicate effectively to a wide range of audiences.
- · Fully Integrated: change the diagram, the outline changes also, and vice versa.
- -Reports & Proposals-Project Planning & Timelines -Outlines — Charts & Diagrams—Action Items & Notes — Managing Meetings

"Inspiration is a neat way to take an idea and represent it in a visual format. It lets you see your ideas, making them easier to understand."

-Michael I. Miller INFOWORLD

"Inspiration from Ceres Software offers building blocks for creating easy cut and paste diagrams and outlines."

-MacWeek

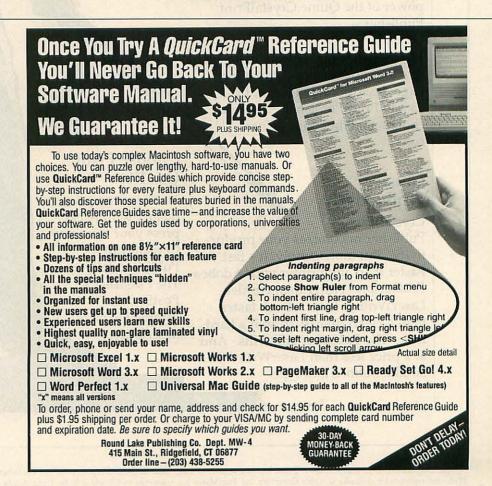


NEW VERSION INSPIRATION \$175 Visa/MC Demo also available.

Call 800-366-4565

Ceres Software, Inc. 9498 S.W. Barbur Blvd. #103 Portland, OR 97219

Circle 365 on reader service card



The Power stole



In the world of desktop publishing, no personal computer can match the power of a Macintosho.

It's the only choice. But when it comes to a page printer, you need to choose the one with performance to match. Now you can choose the power of the Qume CrystalPrint Publisher. M.

With its ultra-high speed, compact size and PostScript®-compatible page description language, the CrystalPrint Publisher gives you choices no other page printer

Choose Productivity

CrystalPrint
Publisher maximizes your productivity. Put more simply, it's fast.
Faster than any printer with Adobe® PostScript® Faster than Apple® LaserWriter® IINTX. Even faster than LaserWriter IINTX with a hard disk. The Publisher still wins. And at a price less than LaserWriter IINT. So illustrations and type

® Comme Commenters 1988

that used to take minutes to print are now in your hands in seconds. You spend more time creating and less time waiting to see what you've created. That makes you more productive than ever.

Choose Print Quality

You need top print quality to fully express your creativity. CrystalPrint Publisher delivers. The Publisher's PostScript®-compatible page description

print detailed drawings with fine lines, solid blacks and smoothly graduated grays.

Mix in text using the wide range of resident authentic type-faces from ITC and Bitstream.

The result — elegant images with print quality not even the LaserWriter II can match.

Choose Convenience

The Publisher's footprint is more than 43% smaller than the Laser-Writer II.
That's the smalles of any competitive

[®]Qume Corporation, 1988. Qume and the Qume logo are registered trademarks of Qume Corp. CrystalPrint Publisher is a trademark of Qume Corp. Apple, Macintosh and Laser-Writer are registered trademarks of Apple Computer, Inc. PageMaker is a registered trademark of Aldus Corp. Adobe and Adobe Illustrator 88 are trademarks of Adobe Systems, Inc. PostScript is a registered trademark of Adobe Systems, Inc. Bitstream is a trademark of Bitstream, Inc. ITC is a trademark of International Typeface Corp.

SCHWAB

page printer. Which means the Publisher stays close and convenient — where you need it— even in the most space conscious environments.



Compare, Then Choose

Let your Qume dealer show you the power of the CrystalPrint

Publisher. Ask them to print this page on the Publisher and then on an Apple LaserWriter II. After that, the choice is yours. Choose the winner and you'll choose Crystal-Print Publisher. With its speed, print quality and convenience, no other page printer can match the power of your Macintosh. Crystal-Print Publisher is the power to choose. For information or a demonstrátion, contact your nearest Qume dealer or distributor. Or contact Qume at (800) 223-2479.



The Company with Peripheral Vision.

CrystalPrint Publisher™

Graphic Proof of Quality and Speed

You know graphic quality when you see it. That's why we used an original printout taken directly from the CrystalPrint Publisher to produce the artwork for the adjacent page. So you can see the fine lines, the well-formed characters and uniform blacks for yourself.

You also know the importance of speed. The LaserWriter IINT takes 172 seconds longer to print the same page. Even the expensive, top-of-the-line Laser-Writer IINTX takes longer.



CrystalPrint Publisher



LaserWriter IINTX



LaserWriter IINT

Now, the choice is yours. Choose CrystalPrint Publisher and choose print quality and speed. Then spend more time

creating and less time waiting to see what you've created.

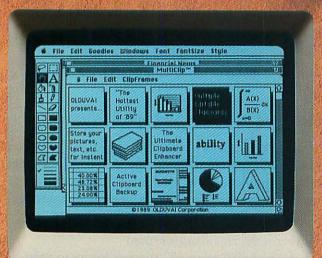
CrystalPrint Publisher . . . The Power to Choose.



Qume Corporation, 500 Yosemite Drive, Milpitas, CA 95035 (800) 223-2479

End users circle 353 on reader service card Dealers circle 115 on reader service card

CUT, CUT, COPY... PASTE, PASTE, PASTE.



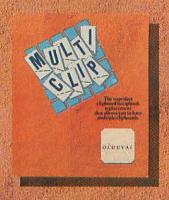
INTRODUCING MULTICLIP

At last! Multiple clipboards to continuously cut, cut and copy and then paste, paste and paste. All without losing any information or tediously going through the scrapbook.

This is new MultiClip; the superfast scrapbook/clipboard replacement that lets you have multiple "ClipFrames," maintain a back-up of all your clipboard activity and even edit the contents of each ClipFrame.

So if the regular clipboard and scrapbook leave you cold call us toll-free at 1-800-822-0772 to get your hands on the hottest utility of '89—MultiClip.

Also available, our companion utility, CLIPSHARE, which allows you to transfer clipboard contents to any user on a network.



OLDUVAI Corporation, 7520 Red Road, Suite A, South Miami, FL 33143 (305) 665-4665 Fax (305) 665-0671

Circle 284 on reader service card

"I THINK IT WAS IN THE AUGUST ISSUE "

Keep your copies of *Macworld* at your fingertips in our special file cases. Each handsome *Macworld* case holds twelve issues, ready for use again and again.

This is a great value at \$7.95 for one file; \$21.95 for three; or \$39.95 for six files (Pennsylvania residents add 6% sales tax). Please add \$1 per case for shipping and handling. Send your check or money order, payable to Jesse Jones Industries, to Jesse Jones Industries, Dept. MCW, 499 East Erie Avenue, Philadelphia, PA 19134.

The Iconoclast

already pulled off the tape, revealing a familiar blue, three-letter monogram.

"I would have told you eventually," said Gates. "But now you know."

"Well, I know, but I still find it hard to believe. A dream Macintosh—at a dream price. This whole thing seems too good to be true. Just tell me this, before I spill the story to my readers. Is this going to be another vapor product? A tease? A hoax? Can you give me a firm shipping date?" I asked

Gates smiled. "We sure can." He walked over to a television, flicked it on, and pushed a button on a VCR. "Just look at our ad, which will run on all three networks, selected independent stations, and with heavy rotation on MTV for a week beforehand."

The commercial shows scruffy people in jeans lining up in an orchard, with some sort of New Age music playing in the background. A scruffy youth is sitting behind a table at the head of the line, handing out apples (the fruit). Each person takes an apple and then walks off a cliff.

The camera pans to the rear of this line. At first we see only one or two people wearing suits. Then we notice more. The camera cuts back to the head of the line where a pair of guys in suits now man the table; as they give out apples they demand people's wallets before the short walk to the cliff. The New Age music becomes deafening. Suddenly from the distance comes a phalanx of Charlie Chaplin look-alikes wearing running shoes and carrying copies of Ted Nelson's Computer Lib book. They throw the books at the guys behind the table, literally upsetting the Apple cart. Everybody dances.

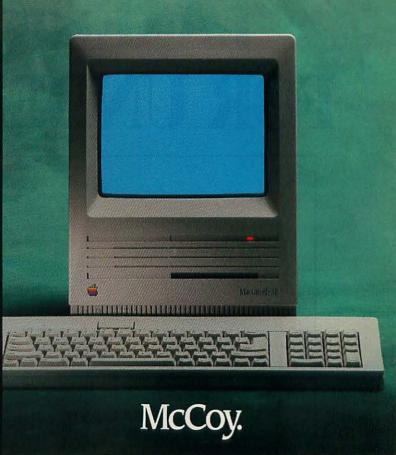
The screen goes black and these

words appear:

"1989 won't be like 1984 anymore." The screen goes black again. A voiceover (is it Martin Sheen?) ominously finishes:

"IBM's Mac clone," says the voice, "shipping April first." □





We had these two talking in no time at all.

Seems like every time these two boys set down together, they commenced to fightin. If one said day, the other night. Good thing the folks at TOPS settled this feud once and for all. It's so dang simple, too. Just install TOPS software in each Macintosh and PC in the

TOPS Tech Specs

- One copy of TOPS software required for each network station.
- TOPS supports AppleTalk and FlashTalk running on twisted-pair cabling (telephone wire), and EtherTalk on thick or thin Ethernet cabling.
- IBM PCs, PS/2 Models 25 or 30, or compatibles require TOPS FlashCard, 3Com EtherLink II or other network card. PS/2 Models 50 through 80, or compatibles require 3Com EtherLink/MC card or equivalent.
- TOPS can be configured as a distributed, dedicated, or combination network.

place. Throw in a network card for each PC. Add a little twisted-pair telephone wire, and suddenly they're behaving like family.

Next thing you know, they're swapping files, sharing peripherals, and trading data from Lotus 1-2-3 to Excel, dBase III to dBase Mac, and most other PC and Mac applications. Or tapping into whole other networks and systems, such as Novell, AppleShare, Sun, and VAX.

What's more, no central file server is needed—though

TOPS can easily accommodate one as a business grows. And no special training is required. No wonder TOPS is the standard for easy-to-use PC to Mac connectivity.

Maybe that's why folks say, when it comes to making connections, TOPS is the real McCoy. Call the TOPS Division of Sun Microsystems at 800-445-TOPS (from outside the U.S. and Canada, call 415-769-8700). Or write 'em at TOPS, 950 Marina Village Parkway, Alameda, CA 94501.



LASER QUALITY FOR UNDER \$1000



Affordable Macintosh Publishing

In the past, Macintosh users had to choose between printers they could afford and output that looked good. Laser quality, previously out of reach, is now available to everyone regardless of his budget. The new DeskJet 300 DPI printer from Hewlett Packard provides the solution.

With a retail price of only \$995, the DeskJet offers quality matching that of the Apple LaserWriter IISC, at a cost below that of the ImageWriter LQ. At only 14 lbs., the DeskJet easily follows you to where the work is. Additional features include easy front paper loading, affordable and convenient ink cartridges, and envelope printing. If you need top quality output for the home, school, or small business, the DeskJet delivers.

The DeskJet and the Grappler LS

Until recently, the only problem with the DeskJet was that it didn't work with the Mac. Now the Grappler LS printer interface provides a complete solution, allowing the DeskJet to print from the Macintosh at a professional 300 DPI. Now your letters, homework, proposals, and every document you produce can have that laser quality desktop publishing look.

Quick Draw Printer	Resolution	Price
Apple LaserWriter IISC	300 DPI	\$2,799
Apple ImageWriter LQ	216 DPI	\$1,399
Hewlett Packard DeskJet	300 DPI	\$995
Apple ImageWriter II	144 DPI	\$599

Grappler LS

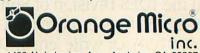
The Grappler LS is the latest Macintosh interface solution from Orange Micro. The Grappler LS connects the HP DeskJet or any HP compatible serial laser printer to the Macintosh Plus, SE, or II and drives it at its full 300 DPI resolution. To achieve this, the Grappler uses a standard Apple printer driver and translates the output for your printer, allowing compatibility with hundreds of popular packages.

The Grappler LS comes complete with cabling, spooling software, and 3 fonts families (Times, Helvetica, and Courier look-alikes). Look for the Grappler LS and other Orange Micro products to bring the best printing solutions to you and your Macintosh.

NEW! Optional Grappler LQ/LS font package!

Make your Grappler output even more effective with three new complete font families and five special headline fonts. Families: ITC Garamond Book, ITC Zapf Chancery Medium Italic, Dutch Italic. Headlines: Blippo Black, Broadway, Cloister Black, Bitstream Cooper Black, and ITC Zapf Chancery Medium Italic.

See your Apple dealer today or contact:



1400 N. Lakeview Ave., Anaheim, CA 92807 (800)223-8029 in CA (714)779-2772

Grappler; Macintosh, ImageWriter, Laserwriter, ¿pple; Hewlett Packard, DoskJet, are trademarks of Orange Micro, Inc., Apple Computer, Inc., and the Hewlett Packard Company, Inc., respectively.



Apple's Big Chance

Winning loyalty as well as sales

by Deborah Branscum

"The first disk drive that went just squeaked by under the very short-term warranty. The next drive died a month later and had to be sent to our corporate headquarters, where we have a service contract. The replacement drive failed inside of two weeks."

So goes the scene in "Nightmare from Cupertino," a horror flick starring Bruce Bicknell and a supporting cast of Mac SEs, which took place at a printshop in Albany, New York. After a fourth drive failed, our leading man complained bitterly in a letter to Apple.

"People who come in to use our machines will see a strip of white tape covering the lower drive so they do not inadvertently stick one of their disks in this drive and risk corrupting their data. This is very distressing to me as a consultant who advises people to buy Macs. I hate to have to say to people that the Mac's [floppy] drives have a strong tendency to fail, and the warranty is for only 90 days."

According to an Apple spokesperson, the company answers all of its mail, and even responds personally if a form letter seems inappropriate, but Bicknell never received a reply.

Last June, about seven weeks before Bicknell sent his letter, Apple announced the formation of a Customer
Satisfaction Group to "make it easier for
customers to do business with Apple."
At press time, nearly a year later, the
group still lacks a leader and faces the
daunting task of placating users made
hostile by poor support, high prices,
and dealers from hell. It's a big job,
but by listening hard to users, Apple
could turn around its image as arrogant, uncaring, and insensitive.

As a start, Apple should offer its customers a one-year warranty, just as



BCS Update, edited by Mary McCann, surveys its readers every month. In January, almost balf of the survey respondents agreed that computers pose some physical threat to frequent users.

IBM, Compaq, and Hewlett-Packard do. Of 27 hard disk manufacturers surveyed, only Apple and two other companies limit their warranty to 90 days. One drive vendor, Microtech International, even offers a five-year policy; several others provide two-year warranties.

Canadian customers already enjoy a one-year warranty on any Apple product purchased from an authorized dealer. According to Apple Canada, studies reveal that the Canadian business customer cares most about product reliability, service, and support in making a personal computer purchase. Are U.S. customers really so different?

Apple would gain enormous goodwill—and would probably lose very little—by beefing up its warranty for U.S. customers. Although few users may personally experience a serious hardware malfunction, it's grossly unfair that people who have—like Bruce Bicknell—aren't adequately protected.

Allan Loren, president of Apple USA, tells me that Apple doesn't believe that it needs to change its U.S. warranty, since the longer Canadian warranty involves a different competitive situation. "We have different pricing, different discounts; it's not the same market," he says. Apple will cover products that "fail shortly after warranty," according to Loren. "Unless there's something extraordinary going on, we're pretty lenient about that kind of thing."

Conspicuous Consumer

Loren points out that "the extended warranty program that our resellers sell would be affected by a change of warranty," making it "more complex than what may appear on the surface." It's not clear that everyone would benefit from a change in the warranty, he says, but the point "is well taken and we'll be looking at it with our new set of products."

Apple has been plagued by support problems as well. Early buyers of Apple's CD ROM player, for instance, were told they would receive a free software upgrade last August, which would support the High Sierra format. Four months later users are still waiting for the upgrade, yet Apple denied there was a problem. The Apple CD SC product manager was quoted in the trade press as saying the driver "came out as expected, and right now it's merely a pipeline issue." That's classic doubletalk and was cold comfort to those who needed the upgrade.

Apple should start paying as much attention to established clients as it does to new ones. Reportedly, the manager of End User Computing at a Silicon Valley corporation wasn't contacted by an Apple national account executive for 18 months, despite the company's 800 Macs. The marketing support rep from Apple was nigh invisible as well, apparently the result of having too many accounts to service.

Fortunately, it's nearly spring now, and there are a few flashes of sunlight to warm the hearts of beleaguered users.

Apple is experimenting with a toll-free number in one of its field offices to provide customers with better access to information. Support Navigator, a CD ROM disk with technical information and answers to common questions, has been distributed free to dealers, key customers, and field offices since last fall. (User groups and corporations can probably get a copy if they ask nicely.)

The company is establishing links with consultants and has offered tentative support to groups like the Apple Professional Information Exchange. More important, Loren says Apple's vice president of customer satisfaction will act as an "ombudsperson" to represent Apple customers.

Several corporate users say that Apple

officials have been especially attentive recently, in marked contrast to earlier experiences. And Apple's User Group Connection has been an invaluable problem-solving resource for many. "Some of the most cooperative people at the company are in the User Group Connection," says Dave Game, president of the Gold Coast Mac User Group in Miami. "Access to them is almost reason, in and of itself, for joining a user group. Their helpfulness, combined with Apple-Link access made available to user groups, provides a real tool for users." That's the kind of support Apple needs to provide—real tools for everyone.

Users Unite

■ The fourth annual National Apple User Group Conference will be jointly hosted by Apple and Apple Pickers, the Indianapolis user group. NAUGC '89, which will be held from March 31 through April 2, will include seminars on finances, publishing newsletters, and working with dealers (for further information, call Daniel Zoller at 317/291-4042).

Last year's gathering helped launch

If you missed MacUser Labs' color

If E-Machines told you the T16[™] color Macintosh monitor set the

As our top-ranked mo Labs Seal of Approval.

standard to which all others aspire, you'd probably think we were tooting our own horn.

But what would you think if we told you MacUser Labs made the T16 the standard bearer? It's true. Of the 25 color monitors they tested, MacUser Labs scaled their ratings of all the monitors against the best monitor—the T16.

Nearly two Apples for the price of one.

With a T16, you'll have almost twice the working space of Apple's 13" monitor. Yet your color display won't cost any more than your Macintosh II.

As our top-ranked monitor, the T16 wins the MacUser

value you've

This is the

been demanding. Actual size 72 dpi, with a palette of 16.7 million brilliant colors on a Sony Trinitron modi-

fied to E-Machines' exacting specs.

You can put a little color in the cheeks of your company president next time you produce the newsletter. Or use color to distinguish multiple layers and objects in CAD drawings. Or create charts to transform complex numbers into easily understood color graphs.

Its (T16) impressive gray purity and color saturation provide excellent image quality for both color and shading. It has a pleasing white screen and the sharpest image of all the large-screen monitors we tested. In short, it makes no compromises. The T16 is an excellent choice for CAD/CAM or color graphics work.

Whatever you do on your Macintosh, you'll do it more productively with a T16.

the Apple Professional Information Exchange, a group with several chapters nationwide (call 408/745-0665 to sign up; Connect users can send a message to APX.) NAUGC is a terrific place to meet serious, involved users. Hope to see you there.

■ The annual NYMUG Fair will happen April 29. The New York City group's major fund-raiser, this fair attracted some 56 vendors and 1500 attendees last year. A hands-on room allows users to try out a demo disk or two. For more info, leave a message on the NYMUG answering machine at 212/691-0496.

Boston Is Up-to-Date

The Boston Computer Society has revamped its publications by replacing the bimonthly *Computer Update* and monthly *Calendar* with a monthly magazine called *BCS Update* (back issues are available for \$4 each).

Each issue includes "Member Forum," which allows users to debate their concerns. Last November's "Member Forum"—by Teresa A. Martin—was "Do Computers Make You Sick?" This inter-

esting article discusses studies of VDT use, includes ergonomic hints, and lists sources for more information.

The BCS takes a strong stand on the issue by sponsoring an annual Wellness Conference and by running a regular column, "To Your Health," which covers the VDT debate, research, and specific case studies that show how particular users are dealing with the issues in practical ways. Call 617/367-8080 to become a member or to get further information.

Service Heroes

"In an era of drop-dead service and expired warranties," Ben J. Zander writes that he was absolutely floored by the effort of Computer Pros of Wayne, New Jersey. "Both Nick [Lucia] and Russell [Couter] spent almost 7½ hours trying to make a sick LaserWriter healthy. More to the point, they came back to my office after hours—at 10 p.m.—and didn't leave until 2:30 in the morning. When the LaserWriter still failed to work, they

packed it up, took it with them to the store, and the next day promptly delivered a replacement while they tried to cure an obscure problem."

Greg Rogalski writes that "one rarely hears of a software company that delivers more than it promises," but reports that Spectrum HoloByte is one such vendor. He bought Falcon, an F-16 simulation game, when the option of dogfighting another human via cables or modem was only a promise. He was delighted to receive an update that included the promised enhancements, plus several others at no cost.

I love happy endings. Send your nominations for sainthood to Service Heroes, Macworld, 501 Second St., San Francisco, CA 94107 or via AppleLink (Macworld1) or Connect (Branscum). Of course, there are plenty of sob stories out there as well, so drop me a line if a company ignores you. I will help solve your problem, if I can. Attention, user groups: let me know what events you sponsor, so we can spread the word.

report, here's a condensed version.

As with other E-Machines models, the T19 screen image is very sharp and has excellent color quality and gray purity. Image quality is comparable to the T16, and for those who want a larger screen, the T19 is the way to go. E-Machines has once again produced a winner in the color monitor market.

72 hertz eliminates flflflflicker.

Try staring into a 19inch monitor

with a 60 hertz refresh rate for an 8-hour day. You'll be watching a constantly throbbing screen, and your eyes will feel like they put in a 24-hour day. Not exactly condusive to getting things done. The T19 has the fastest available refresh rate of 72 Hz. Now that's refreshing.

Even more refreshing, the T16 and T19 are the only color monitors certified to comply with ANSI Human Factors Specification 100.

We'd like to color your thinking.

Of course we would—but you should decide for yourself if the T16 and T19 are as good



as MacUser thinks. Go see one and conduct your own review. For details, write E-Machines at 9305 SW Gemini Drive, Beaverton, OR 97005 or call us direct for your nearest dealer: 1-503-646-6699.



©1988, E-Machines.

Circle 101 on reader service card
Macintosh, Macintosh II are trademarks of Apple Computer.



From the company with a famous name...

EMACus Aurelius

Marcus Aurelius. Roman Emperor. Philosopher. World conqueror. This guy was more than just a tin suit and a bowl of grapes. He knew a thing or two about command.

At EMAC, we don't have Marcus' hankering to rule the world, but we did borrow a few of his ideas for our Impact external hard drives. While he commanded huge tracts of land, we've settled for lots of data – 40, 60 or 80MB to be exact.

And Impact hard drives access that data faster and more quietly than any other

drives in their class. Yet unlike Marcus' empire, the Impact hard drives don't take up much real estate. All in all, a command performance.

Come to think of it, maybe we do want to rule the world. The Macintosh™ world.

EMAC – a full line of products and support from the company with a history of success.

Impact hard drives. 40MB and 60MB; 29ms acess rate, 30,000 hour MTBF.

40MB and 80MB; 19ms access rate, 50,000 hour MTBF. LaserWriter NTXII-compatible.

48431 Milmont Drive, Fremont, CA 94538 For more information call 800/821-0806 ext. 2222 (in CA 800/821-0807 ext. 2222)



The Slowing of QuickDraw

How these software routines rule the Macintosh

by Thom Hogan

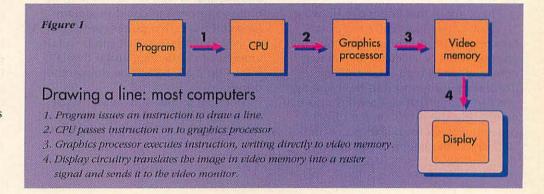
Last month I discussed in general the areas that most affect the overall speed of a Macintosh. This month we're going to explore one of these areas in detail: the Macintosh video display.

What you need to know about the Mac's video display is best summed up in a single fact: the central processor has to do all the work. That's important, because Apple is pretty much alone in burdening the CPU with display work. Virtually every computer from an Atari ST to a Sun workstation uses some form of dedicated graphics controller to handle the display. Even the IBM PC uses a video chip—albeit a wimpy one that is often ignored by programmersto control the display. Out in a field by itself, only Apple uses a set of software routines called QuickDraw, all of which are executed by the same 680x0 processor that's doing all the other primary work in the system.

To illustrate the differences in design, and how Apple's design affects overall system performance, let's take a simple drawing task and note how various machines perform them. The task I have in mind is drawing a diagonal line on the display.

To draw a line, all programs must supply a starting point and an ending point for the line. Internally, what happens next on a Sun workstation or sim-

Thom Hogan is president of Macreations, a Macintosh software developer and publisher of The Macintosh II Report. His reference book, Programmer's Macintosh Sourcebook, was recently published by Microsoft Press.



ilar machine is that those end points are passed to the graphics processor along with the instruction to draw a line. The CPU is now free to do other things while the graphics processor does the actual job of updating the display. Deep down in the video circuitry of these computers, you'll find a set of memory that belongs only to the graphics processor. The graphics processor draws its pixels in that memory, and special display circuitry reads that memory as it sends the actual video signal to the monitor (see Figure 1).

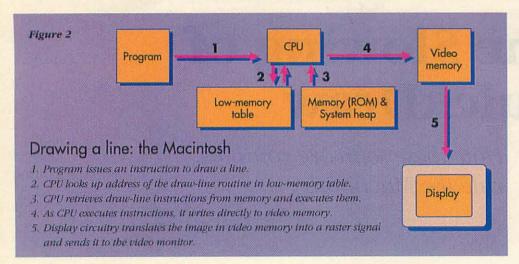
In machines like the Sun, anything you want to display is really sent as an instruction from the CPU to the graphics processor. And these instructions can be quite compact. Instead of sending an instruction that says essentially, "draw a line from x to y," the processor might send a *tokenized* version. Tokenized means that the instruction has an arbitrary abbreviation, usually a single byte or word. For example, if \$0D is the token to draw a line, then the CPU need send only three pieces of data to the graphics processor: xposition y position

\$0D (that's probably three computer words of data).

Contrast this to the Macintosh design. If you want to draw that same line in the Macintosh, you seemingly do the same thing: you write a program call that specifies the two end points and the Quick-Draw action you want taken (draw a line). It's what happens with this information that is different. In the Sun world, the CPU immediately translates the information into the tokenized version that it then sends to the display processor. In the Macintosh world, the call results in the CPU looking up address values in a low-memory table, to see where in memory the routine that draws lines is, and then passing control to that routine (see Figure 2). The CPU then executes that routine (which may be a few bytes long or many bytes long, depending on its sophistication), and no new instruction can be executed until the screen drawing is done. From beginning to end, the Mac's CPU is involved with that line-at no time does it hand off in-

(continues)

State of the Mac



formation to another component to do the work.

Think about that line we're drawing. To draw a diagonal line, each point between the start position and the end position must be calculated. You may remember from high school geometry that lines are supposed to be infinitely small in width (that is, they have no real width). But the pixels on the display certainly have a fixed size. So, as the CPU draws the line, it is calculating

which pixel on the screen is closest to the line that would be drawn if an infinitely narrow line could be drawn between those two points (see Figure 3). As you might guess, that can be a fair amount of calculating, and if the CPU has to do it all, it can't be doing other things.

But wait a minute, you say. What about the graphics processor in those other machines? Doesn't it have to do the same calculations? Sure, but it does them on its own, without tying up the CPU. And since the graphics processor has been optimized for performing drawing functions, it can usually do them faster than the CPU can.

So the Mac's CPU does a lot of calculating. How much penalty do we pay for that? Well, that's a tough question to answer precisely. To draw a single black pixel on a white display is trivial for the 680x0. One nice thing about the 680x0 CPU lineup is that it has excellent bit-handling abilities. And, at least in black and white, a single pixel is represented by a single bit of memory. So, if your programs are full of draw-a-pixel-at-x instructions, you won't see much speed improvement over the Mac's CPU from a graphics processor.

Another thing that the Mac does well is move blocks of black-and-white pixels around on the screen. (A Quick-Draw instruction called CopyBits is usually used for this operation, and it's efficient.) So, once those lines are drawn on the display, the Mac can often move them around with little or no sacrifice in speed.

We've got a new toy for you to play with. Crayons Outern Britist Coors Outer Britist Coors

The Hewlett-Packard PaintJet color printer for the Macintosh.

Because not all business solutions are black and white.

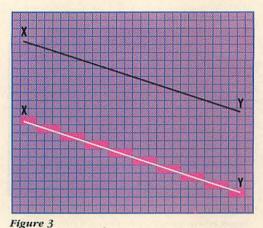
Some, of course, are in color.

Great, smashing, eye-catching color. Beamed up on an overhead. Or tucked neatly into a professional report. Driving home an issue. Reinforcing a conclusion. Color gives you an edge.

With 256 colors on the Macintosh II and 8 on the Macintosh SE. For only

But Macintosh software generally doesn't create displays pixel by pixel. Instead, we programmers call Quick-Draw routines to draw lines, boxes, ellipses, and strings of text. And once we've got those items displayed, we often want to do more than just move them around the display with CopyBits. Indeed, much of QuickDraw's lure for programmers is its sophisticated regionhandling abilities. A QuickDraw region can be just about any group of connected pixels, regardless of shape or size. It's sort of like the lasso tool in MacPaint-the area you select with the lasso is a region. There are QuickDraw commands to move regions, invert regions, hide regions, copy regions, and do all sorts of other interesting manipulations with them.

From a programmer's point of view, that's great. Instead of fooling around with pixels and bits, your program can deal directly with larger concepts, like lines, rectangles, polygons, and regions. From a performance standpoint, however, it can often be the pits. No matter how great a genius you think Bill Atkinson, the principal designer of QuickDraw, is, you can't expect miracles.



The top line is a theoretical line drawn from point x to point y. The dotted boxes represent the underlying pixels on the display. The bottom line has been drawn using the pixels that come closest to matching the line's actual path (in white).

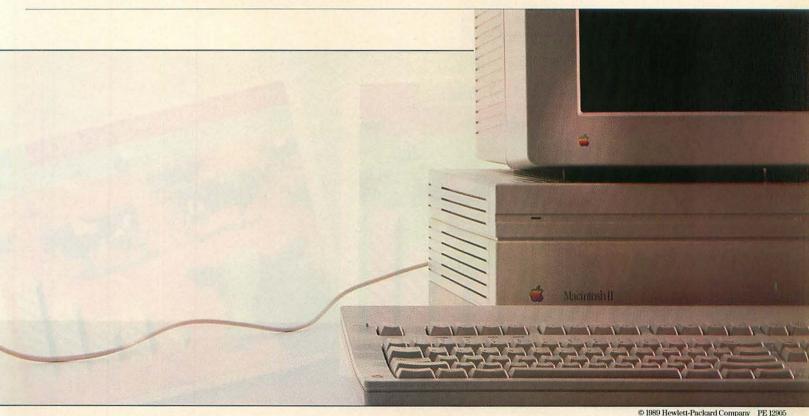
Bill did an excellent job of creating fast, efficient screen-drawing routines. But they all have to be executed by the CPU, and as I mentioned earlier, no new instruction can be executed until the screen drawing is done. This is one of the reasons behind last month's conclu-

sion: speeding up the CPU is probably the most effective way of speeding up a Macintosh.

The addition of color in the Mac II made things worse in the QuickDraw realm. In a standard Plus or SE, Ouick-Draw is dealing with 342 by 512 bits, or a total of 175,104 pixels. In a monochrome Mac II display, that number has been upped to 307,200 pixels (640 by 480). That's almost double the number of pixels the CPU has to deal with. But the 256-color mode of the Mac II makes that total 2,457,600 (640 by 480 by 8) pixels. That's 14 times the number of pixels in a standard Mac.

Even if the CPU does nothing but write white pixels on the entire screen, we're starting to see significant performance degradation as we get into the advanced color modes. Consider this: the 33MHz 68030 handles about 4 million instructions per second. To manipulate our display memory directly, we need to set 307,200 pixels. At 24 bits per pixel, that's a little over 7 million bits of information. The best-case situation results in a write time of about .17

(continues)



\$1,395. Plus \$125 for an interface kit that connects simply and cleanly.

Call 1-800-752-0900, Ext. 214E, for an authorized Hewlett-Packard dealer.

And just wait till you try your hand at coloring.

It will be the most fun you've had since the first grade.

Circle 343 on reader service card



State of the Mac

seconds. Can you see .17 seconds? You sure can; it's about three times longer than the persistence of vision limit that our eye/brain combination translates into continuous motion. And that's just to write the entire set of pixels to a single color on a Macintosh that's faster than any that you or I could buy from Apple. In other words, we're talking about optimum here. I've seen 24-bit displays that take as long as a second to update the screen.

The real world is much more complex than the example above, of course. Coupled with that is the fact that color bitmaps to date have not been contiguous sets of bits. (We're getting to the chunky, planar, and chunky-planar stuff you may have heard about.) A monochrome bitmap in the Macintosh is designed as a set of adjacent pixels (bits) in memory (see Figure 4). The second pixel on the top row is the second bit in memory, the third pixel is the third bit, and so on. The 256-color mode that QuickDraw currently uses is chunky. This means that each pixel is stored as a "chunk" of memory in the bitmap. When you turn the monitor colors to 256, you are using

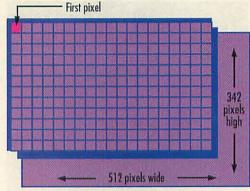


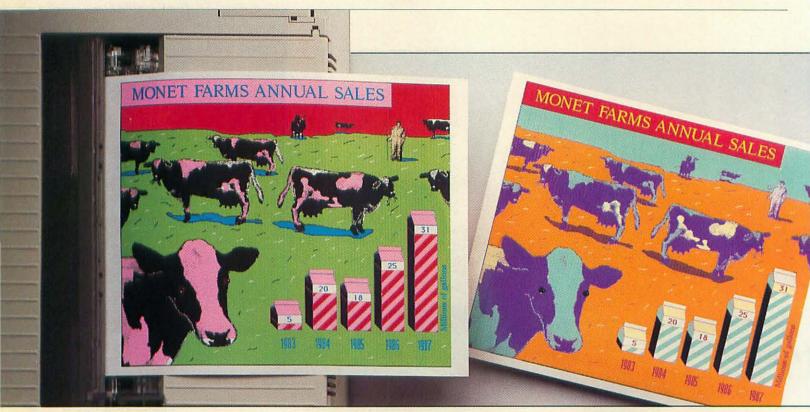
Figure 4

Monochrome Bitmap: Note that each row of pixels is 64 bytes in size (512 pixels by 1 bit per pixel ÷ 8 bits per byte).

8-bit color, so each pixel is stored as 8 consecutive bits, which contain a code representing color (see Figure 5). That code is actually an index into a color table, which holds the true RGB information the system needs to know to draw the actual color. Thus, the CPU can't simply grab one thing to get information about a single pixel—it must grab eight things. Worse still, the eight things it

grabs aren't actually the pixel's color. Instead, that value is a coded entry into the current table of colors (the palette). That CPU is starting to do a lot of extra work, isn't it?

The 24-bit color world gets even more fascinating. One definition of extended color (used by the original RasterOps 24bit color boards) uses a modification of the 8-bit color mode. Instead of one plane of 8-bit pixels, there are three. Each pixel is now represented by three 8-bit values. The three planes represent the red, green, and blue components of the pixel. And the 8-bit pixel value in each plane is again an index into a palette, this time individual indexes for red, green, or blue. But still, the CPU has to go to many places to read the information about a single pixel. Recently Apple released information to developers about the rewrite of color QuickDraw that will appear in the next version of system software. Developers have received three full releases of the software and Apple will probably issue one more. True-Vision, RasterOps, and SuperMac are all shipping boards using the new 32-bit color model. Everyone I've talked to about the 32-bit color model says the



With the new PaintJet color printer from Hewlett-Packard.

Look at the possibilities. Instead of basic black and a few dull shades of gray look at the zip that color adds to your graphs and charts. Overheads will command attention. And reports will have sparkling visual surprises tucked inside.

The PaintJet printer brings so much



final release is right around the corner, but they also indicate that update speeds. while somewhat better than those of the current 24-bit products, are still not anywhere near equivalent to the monochrome or 8-bit color speeds.)

So far, each new iteration of Apple's display mechanism has required more and more effort on the part of the CPU. That trend has got to stop, or else not too far in the future we'll need a 68GHz

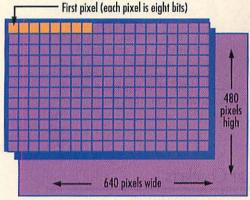


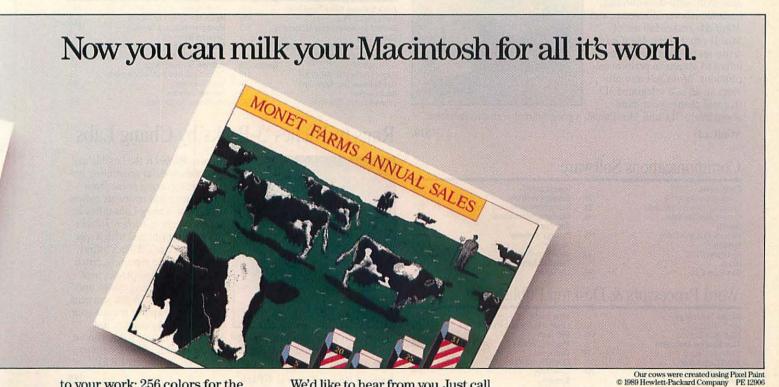
Figure 5 Color Bitmap: Note that each row of pixels is now 640 bytes (640 pixels by 8 bits per pixel + 8 bits per byte).

68090 chip to power our Macs. Well, some hope can be found, even if it may still be a while before we get an actual product. Apple, SuperMac, and Radius have prototypes of QuickDraw processors-add-in boards that offload some (but not all) of the QuickDraw chores from the CPU, Radius's board has the advantage of being designed by several of the original Mac wizards, including Andy Hertzfeld, Unfortunately, Radius has put this project on the back burner in favor of other products, so we may have a long wait for the first QuickDraw processor.

Such boards have their problems, too. Initial tests seem to indicate that their real-world performance isn't as dramatic an improvement as you might expectmaybe 50 percent faster screen writes, on average. That's partly a testament to how efficient the original QuickDraw routines are, and partly a fault of the Mac's hardware design, which doesn't lend itself well to concurrent processing. Another approach is being taken by RasterOps, which has a prototype of a set of software that the company calls Faster Raster. This software translates Ouick-Draw information and instructions into

instructions the TI graphics processor on the RasterOps video board can understand. There's a limiting factor to this approach: TI and Apple treat memory images and regions quite differently, and thus you again end up with the CPU doing significant work translating back and forth. Nevertheless, the idea holds promise, and the RasterOps video board certainly does update the screen visibly faster with the new software. Expect to see this product shortly after Apple officially releases the new 32-bit color standard to the public.

I still expect to see one or more speed-up boards introduced this year, however, and their abilities should improve dramatically as the Macintosh continues to open up to developers. (We could use a faster NuBus, and better I/O support, for example; I expect we'll get it.) How much improvement we can expect is unclear, but I believe we'll eventually have color displays that are as fast as the current monochrome ones. That will be quite an improvement, especially for someone like me, who leaves on the 256-color mode all the time. □



to your work: 256 colors for the Macintosh II and 8 colors for the Macintosh SE, For just \$1,395, Plus \$125 for an interface kit that connects cleanly and simply.

We'd like to hear from you. Just call 1-800-752-0900, Ext. 688C, for your nearest authorized HP dealer. We'll be happy to send you a sample color page. Complete with cows.

PACKARD

Circle 344 on reader service card

Programs & Peripherals

Networking Software & Hardware

CE Software		Shiva NetModem V2400	479.
Quick Mail	159.	SuperMac Software	
Farrallon		Acknowledge	329.
PhoneNET AppleTalk	9.	Multi-User SuperLaserSpool	199.
PhoneNET Din 8 or DB9	35.	TOPS	
Timbuktu	65.	Tops 2.0 Mac, . Tops Dos	
TrafficWatch	145.	or Net Print	Special 119.
LaCie		Tops FlashBox	Special 125.
Silverserver	92.	Tops Repeater	129
Microsoft	10.00	Tops FlashCard	169.
Microsoft Mail 1-4 users	195.	InBox-MacConnection	45.
Olduvai Software Clip Share	109.	InBox-Starter Kit	Special 149.
Font Sharer	149.	Tops Teleconnector Din8 or DB9	39.

Desk Accessory Programs

Affinity Microsystems		Electronic Arts Disk Tools Plus	31.
Tempo II	89.	Mainstay	
Beyond Inc.		Think'n Time	61.
Menu Fonts 2	30.	Olduvai Software	
Borland SideKick V2.0	68.	DA Switcher	25.
Bright Star Technology		Solutions, International	
Hyper Animator	79.	Super Glue	52.
Casady & Greene, Inc		SmartScrap & The Clipper V2.0	46.
QuickDex 1.4A	32.	Symmetry	
CE Software DiskTop 3.0	27.	HyperDA (Reg. 512K)	38.
Deneba Software		TENpointO	
Comment 2.0	54.	OpenIt!	59.

MiniCad+ by Graphsoft

MiniCad+ is a professional CAD system that offers users high precision 2D drafting, including hierarchical symbol editing, fillets, beziers and cubic splines, auto-joint, auto-dimensioning, continuously variable zoom, and MiniCad+ makes full use of Mac II capabilities. MiniCad+'s active spreadsheet can be "hot" linked to objects to perform calculations. MiniCad+ also provides an all new integrated 3D that will change your mind



about micro 3D, and MiniPascal, a programmable macro language.

W. (C.).

Communications Software

Compuserve		Insigna SoftPC	409
Compuserve Starter Kit	24.	Software Ventures	
Grolier On Line Encyclopedia	32.	Microphone II (Includes Glue)	225
Compuserve Navigator	45.	Solutions, International	
DataViz		BackFax	129
MacLink Plus with Cable	145.	Synergy Software	
Freesoft		VersaTerm	65
Red Ryder V10.3	54.	VersaTerm-Pro	195
Hayes		Traveling Software	
Smartcom II 3.0	88.	LAP-LINK	84

Word Processors & Desktop Publishing

Access Technology		Letra Studio	289
Mind Write 2.0	95.	LetraFonts (Various Vol. 1-45 ea.)	69
Mind Write Express	145.	Microsoft	
Allan Bonadio Associates		Microsoft Word 4.0	255
Expressionist 2.0	79.	Quark, Inc.	
Aldus Corporation		QuarkXPress V2.0	499
PageMaker 3.0	399.	QuarkStyle	219
Ashton Tate		Symantec	
FullWrite Professional	269.	More II	245
Broderbund		Symmetry	
DTP Advisor	47.	Acta Advantage	69
Caere Omnipage	565.	T/Maker Company	
Claris		WriteNow V2.0	109
MacWrite 5.0	102.	Word Perfect Corporation	
Emerald City Smart Art	95.	Word Perfect	185
Letraset		Working Software	
Ready, Set, Go! 4.5	275.	QuickLetter	79

TOPS/InBox/FlashBox by TOPS



With TOPS you can transform any Mac with at least 512K of memory into a TOPS Network station, enabling it to share files, printers, and multi-user applications with other computers on the TOPS Network. InBox enables users to send and receive messages, memos, and files over a TOPS Network. With TOPS FlashBox you can speed up your AppleTalk' network and allow your Mac to communicate at the Flash talk speed of 770K

bits per second — more than 3 times faster than AppleTalk!

TOPS	119.
InBox	149.
FlashBox	125.

Spelling & Grammar Checkers

Aegis Development		Lundeen & Associates	
Doug Clapp's Word Tools 2nd Edition	42.	WorksPlus Spell 1.1	46.
A.L.P. Systems		Microlytics, Inc.	
MacProof 3.0	115.	Word Finder (Synonym Finder)	33.
Deneba Software		Sensible Software	
Big Thesaurus	54.	Sensible Grammar or BookEnds	54.
Spelling Coach 3.0 Professional	105.	Working Software Spellswell 2.0	45.
Electronic Arts Thunder! 1.23	30.	Lookup (Makes Spelling Suggestions)	30.

Accounting Packages

Aatrix Software Aatrix TimeMind	er 109.	Insight Expert GL, AR, or AP	455.
Aatrix Payroll Plus	159.	MECA Managing Your Money	128.
Bedford Software Simply Accoun	iting 219.	Monogram Business Sense	279.
Chang Labs		Dollars & Sense 4.0	81.
New Enhanced Version III Modul	es!	Peachtree Back To Basics Professional	
Rags to Riches Gen. 3-Pak 3.1		(GL/AR/AP/INV)	159.
(GL/AR/AP)	Special 289.	Softview Taxview Planner	65
Rags to Riches GL, AR, or AP	119.	California or New York Supplements	39
Dac Software Dac-Easy Light	44.	MacinTax Federal	69
Intuit Quicken	33.	Survivor Software	
Layered Insight One Write	185.	MacMoney 3.0 (En. Ver.)	62
Layered maight One wine	100.	Maciviolity J.O (Lift. Vel.)	U

Rags to Riches '3-Packs' by Chang Labs



Rags to Riches is the flexible and powerful modular accounting system that's winning praise from accountants and reviewers nationwide. Now, Chang Labs offers its popular Rags to Riches '3-Packs' at a special price and with a special bonus! Each '3-Pack' offers the user flexible reporting, batch totals for any time period, user definable accounting cycles, and impressive speed. When you need to analyze, graph or present your accounting information, just

accounting information, just export it to your favorite program! As a special bonus, if you choose the '3-Pack' that suits your needs before April 30th, 1989, *Programs Plus* will send you an Aatrix Payroll program, absolutely FREE!!

Rags to Riches 'General 3-Pack' (G/L, A/R, A/P)	289.
	359.
Rags to Riches 'Retail 3-Pack' (G/L, Inventory, A/P)	359.

Visit us in the Electronic Mall™ on Compuserve - GO PP

to Polish Up Your Mac

Modems

329.	Practical Modem 2400SA	181.
		1000000
179.	(2400SA w/Microphone II & Cable)	229.
	Prometheus	
315.	Promodem 2400M Ext.	
315.	(Software & Cable)	199.
299.		255
449.		
		149
189		
100.		199.
70		349.
	179. 315. 315. 299. 449.	MacCommpack (2400SA w/Microphone II & Cable) Prometheus 315. Promodem 2400M Ext. 315. (Software & Cable) Promodem 2400 299. (Hayes Compatible) 449. Supra Corporation Supra Modem 2400

Specials good through April 30, 1989



Aztec MPW C by Manx Software Systems



Experience the best of both worlds with the complete Aztec C system plus the full MPW Shell. When you use Aztec MPW C, you benefit from the sophisticated MPW Shell, adapted to work with the superior Aztec compiler, assembler, and linker. With Aztec MPW C, you actually have a choice of development environments, the UNIX-like Aztec Shell, or the Apple developed MPW shell. The MPW shell has a powerful

script facility, sophisticated windowing, and Multifinder compatibility.

Game Software

Access		MicroPro Pirates	3
World Class Leader Board Golf	34.	Microsoft	
Accolade		Flight Simulator 1.02	3
Hard Ball or Mean 18	23.	Micro Sports MSFL Pro Draft	2
4th & Inches	24.	MSFL Pro League Football	
Activision Shanghai or Jinxter	24.	or 500 Great Teams	32
Corruption	27.	Miles Computing Inc.	
Universal Military Simulator or Manhole	30.	Harrier Strike Mission II or	
Might and Magić	36.	The Fool's Errand	3
Sky Travel	45.	Mindscape	
Artworx Bridge 5.0	22.	Balance of Power 1990 or	
Avalon Hill Mac Pro Football	28.	Crossword Magic	30
Broderbund		Deja Vu or Deja Vu II	30
Ancient Art of War or At Sea	27.	King Of Chicago, Shadowgate or	
ShufflePuck Cafe	24.	Joker Poker	30
Poster Maker Plus	36.	Defender of the Crown, Colony	
Bullseye Software		or The Uninvited	30
P51 Mustang or Ferrari Grand Prix	32.	Practical Computer Applications	
Casady & Greene, Inc.		MacGolf or Lunar Rescue	35
Crystal Quest	26.	MacCourses	29
Crystal Quest w/Critter Editor	42.	Road Racer	4
Centron Crapsmaster,		Mac Golf Classics	54
Roulettemaster or BlackJack Ace	27.	Primera	
Pokemaster or Baccaratmaster	27.	Smash Hit Racquetball II	19
Discovery Software Arkanoid	27.	Sierra On-Line	
Electronic Arts		Leisure Suit Larry	23
ChessMaster 2000	28.	Space Quest or Space Quest II	29
Chuck Yeager Flight Simulator		Police Quest	29
or Life & Death	32.	Silicon Beach Software	
Starfleet I	37.	Dark Castle or Apache Strike	32
Scrabble	26.	Beyond Dark Castle	32
One-On-One, Pinball Construction Set,		Sir-Tech Mac Wizardry	35
Seven Cities of Gold, SkyFox, or		SoftStream, Inc.	
Patton vs Rommel	15.	Colour Billiards	35
EPYX		Mac Man or Solitaire DA	24
Sub Battle Simulator (Mac or MacII)	29.	Sphere, Inc. Tetris	20
Hayden Software Sargon IV	29.	GATO, Orbiter or Pt-109	26
Infinity Software, LTD.		Solitaire Royale (Mac or MacII)	20
Go or GrandSlam Tennis	27.	Falcon 2.0	32
Infocom		Studio Zero Orbital Mech	29
Leather Goddesses of Phobos	15.	SubLogic Jet	32
Beyond Zork or HitchHiker's Guide	15.	XOR Software	
Zork Trilogy or QuaterStaff	30.	NFL Challenge	59
Zork Zero	36.	Pro Challenge	29

Now Shipping Standard Air by



Customer Service (203) 378-3662 • FAX (203) 381-9043 Monday thru Friday 9 A.M. to 9 P.M. Saturdays 10 A.M. to 6 P.M. (Eastern Time)

OUR POLICIES

- · We accept MASTERCARD and VISA with no added surcharge.
- Your credit card is not charged until we ship.
- If we must ship a partial order the shipment that completes the order is sent freight free.
- If you are ordering by mail, we accept private and company checks. With MASTERCARD and VISA orders include card number and expiration date. Connecticut residents add 7.5% sales tax.
- Locations more than I day away shipped via Federal Express Standard Air services.
- · Federal Express Priority 1 service also available.
- · Sorry, we cannot accept COD orders.

SHIPPING

 Continental United States: Add \$3.00 per order to cover Federal Express Standard Air service. APO/FPO orders shipped 1st Class Mail (add 3% \$5.00 Min charge).
 Alaska, Hawaii and Outside Continental US: call or write for information.

RETURNS

Defective software will be replaced immediately by the same item. Defective hardware will be replaced or repaired at our own discretion. Call customer service at (203) 378-3662 to obtain a Return Authorization Number before returning goods for replacement. Products purchased in error subject to a 20% restocking fee.

All items subject to availability. Prices subject to change without notice.

Mail-in orders (especially from foreign countries), please furnish telephone number.

Positively A Plus



75 Research Drive, Stratford, CT 06497 800/832-3201

Circle 44 on reader service card

Positively A Plus!

Utility Software

ALSoft Disk Express	35.	Olduvai Sottware	
Font/DA Juggler Plus	42.	Icon-It! or MultiClip	39.
Berkeley System Design		Read-It! TS (For Thunderscan)	79.
Stepping Out II	52.	Read-Itt O.C.R. 2.0 (For Image Scanners)	199.
CE Software		PCPC	
QuicKeys (Macro Program)	53.	HFS Back-Up 3.0	54.
Central Point Software		Softworks	
Copy II Mac (Includes MacTools)	20.	Stack Cleaner	29.
PC Tools Deluxe Mac	45.	HyperTools 1 or 2	59.
Fifth Generation Systems		SuperMac Software	
Suitcase II	44.	SuperSpool 5.0	54.
FastBack	54.	SuperLaserSpool 2.0	82.
Power Station	32.	Diskfit 1.4	54.
Pyro!	15.	Sentinel 2.0	155.
HJC Virex	69.	Symantec	
Icom Simulations		MacSQZ!	59.
On Cue	36.	Symantec Utilities for Mac (S.U.M.)	69.
TMON	95.	Williams & Macias	
Microlytics, Inc. GOfer	44.	myDiskLabeler w/Color	31.
Microseeds		myDiskLabeler w/LaserWriter Option	34.
Redux	59.	Working Software	
ScreenGems	47.	Findswell 2.0 (Document Finder)	36.

Printers & Digitizers

Digital Vision		Seikosha	-
Computer Eyes-Mac	Special 209.	SP1000 (Imagewriter Comp.)	235.
Koala Technologies Corp.		Summagraphics	
MacVision 2.0 (Digitizer)	219.	Bit Pad Plus	329.
Kurta		ThunderWare ThunderScan	189.
IS ADB Tablet	255.	LightningScan	409.
Cordless 4 Button Cursor	65.	Mac II Power Accessory	42.

FASTAT by SYSTAT



FASTAT is a statistics and graphics package for people who need graphics, tables, financial projections, and surveys now. FASTAT's point-and-click interface insures an ease of use that won't compromise accuracy and sophistication. FASTAT will handle up to 50 variables and unlimited cases. FASTAT does it all. Summary statistics, one-way and multi-way tables, chisquare, etc. With FASTAT,

sophisticated two and three dimensional graphics are easy.

FASTAT 165

Disk Drives/Hard Disks/Upgrades

AST Research		MacSnap 548S (512E to 2MB w/SCSI)	599.
Mac286 Co-Processor (Mac II)	1069.	MacSnap Plus 2 (MacPlus to	
Mac 86 Co-Processor	419.	2MB Non Expandable)	439.
CMS		MacSnap 2SE or 1024 Option	
SD Series MacStack SD20 (Mac+/SE/II)	569.	(1MB or MacII Memory Exp.)	439.
SD Series MacStack SD30 (Mac+/SE/II)	615.	SCSI Interface/Port	109.
SD Series MacStack SD60 (Mac+/SE/II)	849.	MacSnap Toolkit (torx driver,	
Cutting Edge		opener & grounding set)	15.
Cutting Edge 800k Drive	175.	Personal Computer Peripherals	1,71
Cutting Edge Wedge XL 30		Platinum Color. Optional Built-In	
Plus SCSI Hard Drive	579.	Modems Available.	
Cutting Edge Wedge XL 45		MacBottom HD-21	
Plus SCSI Hard Drive	729.	(20+MB SCSI Hard Disk)	659.
Cutting Edge XL 30 Internal Hard Drive	469.	MacBottom HD-32 (32MB SCSI HD)	699.
Cutting Edge XL 45 Internal Hard Drive	645.	MacBottom HD-45 (45MB SCSI HD)	859.
Dove Computer Corporation		MacBottom HD-70 (70MB	000.
FastNet Networking	Call	SCSI Hard Disk)	999.
Marathon 030 Accelerator	1039.	MacBottom HD 84 (84 MB	550.
Marathon 020 Accelerator	1000.	SCSI Hard Disk)	1249.
MSE 1 (16 Mhz)	585.	Rodime Rodime 20 Plus Ext.	629.
MSE 2 (16 Mhz w/1MB)	979.	Rodime 45 Plus (Ext. 45MB SCSI)	939.
MSE 3 (16 Mhz w/Math Co-processor)	779.	Rodime 450RX (Int. 45MB Mac SE/II)	829.
MSE 4 (16 Mhz w/1MB & Math Chip)	1159.	Rodime 100 Plus (Ext. 100MB SCSI)	1169.
MacSnap 524E (512E to 1MB)	289.	Rodime 140 Plus (Ext. 140MB SCSI)	1319.
MacSnap 524S (512E to 1MB w/SCSI)	379.	Rodime 1000 RX (Int. 100MB MacII)	1045.
MacSnap 548 (512K to 2MB)	459.	Video Technology	1040.
MacSnap 548E (512E to 2MB)	549.	Laser 800k External Drive	185.

MapMaker by Select Micro Systems



MapMaker is a complete business map making system. Map-Maker can quickly uncover hidden relationships in geographic data, and demonstrate the findings with striking presentation graphics. MapMaker includes boundary files for states and counties in the US, and 176 countries in the world. Map-Maker also includes population statistics for each of the United States, as well as 176 other countries. MapMaker is the definitive

tool for market research, site analysis, sales force performance etc.

DataBase Management

Acius 4th Dimension	485.	Fox Software	
4D Runtime	235.	Fox Base Plus	208.
Activision		Fox Base Plus Runtime	158.
Reports for Hypercard	75.	Microsoft	
Focal Point & Business Class Bundle	65.	Microsoft File 2.0	120.
City To City	30.	Odesta Double Helix II	339.
Apple Computer		DataDesk Professional	289.
HyperCard	42.	GeoQuery	199.
Ashton Tate		ProVue Panorama	209.
dBASE Mac 1.0	295.	Software Discoveries	
Borland Reflex Plus	189.	RecordHolderPlus	45.
Claris FileMaker II	237.	TENpointO FocalPoint II	119.

Educational/Creative Software

Educational/Creative	SOU	itwaie	
Ars Nova Practica Musica	75.	Math Blaster or Word Attack!	27.
Barron's Barron's SAT	35.	Electronic Arts Mavis Beacon Typing	36
Bible Research The Word (KJV or NIV)	165.	Venture's Business Simulator	47
Bogas Productions Studio Session	49.	Deluxe Music Construction Set V2.5	85
String Quartet, Country or Heavy Metal	15.	Great Wave Software KidsTime	26
Super Studio Session	75.	Number Maze	27
Bright Star Technology Alphabet Blocks	32.	Crystal Paint	27
Talking Tiles	69.	Individual Typing Instructor Encore	26
Broderbund Clip Sounds	36.	Learning Company Reader Rabbit	33
Jam Session or Black & White Movies	30.	Mindscape Perfect Score SAT	35
Sensei Geometry, Calculus or Physics	59.	w/The Perfect College	46
Type!	20.	Niles & Associates End Note	82
Where in the World is Carmen SanDiego?	27.	Nordic	-
Coda Mac Drums	32.	MacKids Educational Prog. (ea)	28
Perceive	52.	Simon & Schuster Typing Tutor IV	35
Davidson & Associates	10.00	Springboard Top Honors	59
Speed Reader II	39.	Family Matters or Atlas Explorer	28

MAC-101 Keyboard by DataDesk



If you are looking to replace your Mac's keyboard, the *MAC-101* by DataDesk is the way to go. It comes in an ADB version for the Mac SE and II, and a non-ADB version for the Mac 512 and MacPlus. The positive tactile, firm feel 101 includes a full numeric keypad, 15 function keys, 6 page control keys, and a T-style cursor pad.

Keyboard status indicator lights let you know when everything is going smoothly. Includes 101-Keys desk accessory software, a powerful macro utility which allows you to exploit the full power of the function keys with almost any Macintosh application.

MAC-101 Keyboard (Specify ADB or non-ADB)............... 145.

Shipped Federal Express

Business Software

Abacus Concepts		Micro Planning Software	
StatView II (Mac+,		Micro Planner 6.0	325.
SE, II w/68020 & 68881)	349.	Microsoft Microsoft Works 2.0	189.
StatView SE+ Graphics	229.	Microsoft Excel 1.5	255.
Access Technology Trapeze 2.1	155.	Nolo Press WillMaker 3.0	34.
Ashton Tate Full Impact	249.	For the Record	29.
Borland Eureka! The Solver	133.	Paracomp Milo	159.
BrainPower ArchiText	182.	Pro Plus WallStreet Investor V3.0	469.
StatView 512 Plus	175.	Satori Software Bulk Mailer 3.2	79.
Math View Professional	144.	Bulk Mailer Plus	195.
DataScan	118.	Components GL	389.
Bravo Technologies MacCalc	79.	Select Micro Systems, Inc.	
Chang Laboratories		Exstatix	219.
C.A.T. Contacts • Activities • Time	229.	MapMaker	Special 215.
Claris MacProject II	395.	Shana Corporation Fast Forms	89.
D2 Software		SoftView Form Set	55.
MacSpin 2.0	189.	Synex Mac Envelope 4.0	55.
Individual 101 Macros For Excel	37.	Mac Invoice	29.
Mainstay Capture	42.	Systat Systat 3.2	
Mac Flow 2.0 or Mac Schedule	115.	(Specify MacPlus, SE or Mac II)	459.
Meta Software MetaDesign	199.	Fastat	Special 165

ComputerEyes by Digital Vision



ComputerEyes introduces a new dimension to image processing technology with the most versatile and comprehensive video digitizing system in its class. ComputerEyes lets you digitize high quality images from any standard video source, videotape, camera, video disk, and store them on your Macintosh. In as little as six seconds, you can digitally reproduce three-dimensional objects. Computer-

Eyes images can be directly imported into documents created with PageMaker and ReadySetGo! for unparalleled results!

Graphics Software

3G Graphics		Macromind Videoworks II	175.
Images w/Impact Graphics & Symbols	59.	Videoworks II Accelerator	118.
Images w/Impact Business 1	69.	Videoworks II Driver for Hypercard	60.
ABA Software Draw It Again Sam 2.0	79.	Micro Illusions	
Graphist Paint II	289.	Photon Paint	179.
Adobe Systems Adobe Illustrator 88	309.	Micro CAD/CAM MGMStation	685.
Adobe Fonts (Various volumes)	Call	Micro: Maps	50000
Aldus Freehand	349.	MacAtlas Paint 2.0 (MacPaint Format)	45.
Altsys Corp. FONTastic Plus 2.0	54.	MacAtlas Hyper Atlas	64.
Fontographer 2.2	239.	MacAtlas Professional	× 100
Ashton Tate Full Paint	69.	(PICT/MacDraw Version)	129.
Broderbund Print Shop or Clip Charts	36.	Microsoft Microsoft PowerPoint 2.0	255.
Drawing Tables	78.	Miles Computing	200.
CE Software Calendar Maker 3.1	27.	Mac the Ripper or Orchestra of Fonts	32.
Claris MacPaint II	102.	People, Places-Things or Taking	OL.
MacDraw II	309.	Care of Business	32.
Cricket Software Cricket Draw	169.	Olduvai Software	OL.
Cricket Paint	99.	Art Clip or ArtFonts 1, 2 or 3	59.
Pictograph	89.	Paracomp Swivel 3D	249.
Cricket Graph	119.	Silicon Beach Software	270.
Cricket Presents	289.	SuperPaint 2.0	129.
Deneba Software	7.000	Digital Darkroom	169.
Canvas 2.0 (Includes Desk Accessory)	159.	Super 3D	179.
Dream Maker	100.	Solutions International	175.
MacGallery (Hypercard or Paint)	28.	The Curator (Catalog Your Art)	79.
Cliptures	97.	Springboard Certificate Maker	24.
Dubl-Click Software		Works of Art Assortment,	24.
World Class Fonts: Various Vol. 1-6 (ea)	45.	Holiday, or Education	28.
WetPaint: Various Vol. 1-16 (ea)	45.	Works of Art Laser Art or Fonts	59.
Electronic Arts Studio 8 (MacII)	319.	Springboard Publisher	109.
Foundation Publishing Comic People	25.	SuperMac Software Pixel Paint	199.
Comic Strip Factory	44.	Symmetry	,00.
Generic Software Generic CADD	54.	Picture Base & Wet Paint Bundle	95.
Graphsoft Mini Cad 4.0	375.	T/Maker Click Art Letters I, Letters II,	00,
	al 520.	Personal Graphics, Effects,	
Innovative Data Design Dreams	279.	Business Image, or Holidays (each)	28.
MacDraft 1.2B	149.	Christian Images	35.
Laserware Laserpaint Color II	359.	Click Art EPS Illustrations	75.
Letraset ImageStudio 1.5 or StandOut	275.	Zedcor DeskPaint 2.0	69.
			00.

Accessories

Abaton ProPoint (ADB Mouse		Antiglare Polarizing Filter	33
for Mac SE & Mac II)	89.	Mac II Stand and Cable Kit	65
Asher Engineering		Modem/Fax Protector 10	15
Turbo Trackball (Mac & Mac+ or		Modem/Fax Protector 20	25
Mac SE & Mac II)	69.	Power Tree Surge Suppressors	-
CH Products Mirage: Quad or ADB		(10, 20, or 50)	Cal
(Turns Joystick Into Mouse)	39.	Printer Muffler Stand (80 & 132)	24
Mach IV Plus: Quad or ADB	65.	Printer Muffler 80	43
Cutting Edge	00,	System Saver Mac (Beige or Platinum)	64
Cutting Edge MCK-105QK		Super Base	34
Keyboard w/Quickeys	149.	System Saver SE	55
DataDesk	(0.000)	Masterpiece Mac II	105
MAC-101 Keyboard/Beige		New Turbo Mouse (Reg. or ADB)	119
	Special 145.	Universal Copy Stand	22
MAC-101 ADB Keyboard/Platinum		Universal Printer Stand	15
	Special 145.	Mobius	
Ergotron Mousecleaner 360°	15.	Fanny Mac QT (Beige or Platinum)	60
MacTilt (Mac, SE or II)	68.	Mouse Systems	00
Farallon		A+ Mouse (MacPlus)	65
MacRecorder Sound System		A+ ADB Mouse (Mac SE/Mac II)	85
(Mac SE or Mac II)	139.	Moustrak	00
Goldstein & Blair		MousePad 7"x9" Size	8
Macintosh Bible 2nd ed.	20.	MousePad 9" x 11" Size	9
Impulse Audio Digitizer w/soundwa		Orange Micro	
I/O Design		Grappler Spooler	39.
Mac Luggage in Navy or Plat.		Grappler C/Mac/GS	79
Macinware Plus Carrying Case	64.	Grappler L/Q or Grappler L/S	92
Macinware SE Carrying Case	75.	Ribbons	-
Imageware II Carrying Case	49.	Available in Black, Blue, Brown, Green,	
HDware (Hard Disk Case)	49.	Orange, Purple, Red, Yellow, Silver & Gold	
Kalmar Designs		ImageWriter Ribbon	4
Teakwood Roll-Top Disk Cases:		ImageWriter Black 6-pack	20
Micro Cabinet (holds 45 disks)	14.	ImageWriter Rainbow Pack (6 Colors)	20.
Double Micro Cabinet (holds 90 disk		ImageWriter II-Four Color Ribbon	9
Triple Micro Cabinet (holds 135 disks		ImageWriter LQ Black	17
Kensington	,	ImageWriter LQ Four Color	20.
Mouse Pocket (Reg. or ADB)	8.	Seikosha Ribbon Black	6.
Mouseway (Mousepad)	8.	Silicon Comforts MacChimney	0.
ImageWriter or ImageWriter II Cover	9.	(Very Effective Cardboard	
Macintosh Plus/SE Dust Cover	9.	Laminate Convection Cooling Device)	16.
Macintosh SE w/extended Kybd Cov		Targus Imagewriter II Carry Case Blk.	49.
Tilt/Swivel	22.	Macintosh Plus Carry Case Blk.	59.
Apple Security Kit	34.	Deluxe MacPlus-XKB Blk.	69.
Rlank Media			

Blank Media

Single Sided 3½" Diskettes		Centech 31/2" DS/DD Color Disks (10)	19
Bulk (Sony) 31/2" SS/DD Disks (10)	12.	Sony 31/2" DS/DD Disks (box of 10)	19.
Sony 31/2" SS/DD Disks (box of 10)	13.	Fuji 3½" DS/DD Disks (box of 10)	19.
Double Sided 3½" Diskettes		Maxell 31/2" DS/DD Disks (box of 10)	20.
BASF 31/2" DS/DD (box of 10)	17.	Verbatim 31/2" DS/DD Disks (box of 10)	19.
Bulk (Sony) 31/2" DS/DD (10)	17.	3M 31/2" DS/DD Disks (box of 10)	20.
T			

Languages

Redord			
Borland	122	Smethers & Barnes	
Turbo Pascal	68.	Prototyper	72.
Turbo Pascal Tutor	46.	Symantec	
Consulair		Lightspeed C	119.
Mac 68000 Dev. System	59.	Lightspeed Pascal	85.
Manx		Just Enough Pascal	55.
Aztec C	65.	T.M.L.	00.
Aztec C + SDB	99.	TML Pascal II V3.0	139.
Axtec C + MPW	Special 99.	TML Source Code Library II	42.
Microsoft		Zedcore	7.
Quick Basic	65.	ZBasic 5.0	99.



75 Research Drive, Stratford, CT 06497

800/832-3201



ScreenRecord

MacRecorde

"I asked my Farallon dealer for a networking product that'll integrate voice, data, and graphics with AppleTalk networks—and manage the whole operation. I bought all nine of them."

"The PhoneNET System Connector uses ordinary phone wire to create an AppleTalk network. I got one for every computer."

"To make it easy to manage my network and support the users, I'm installing Timbuktu on all the Macintoshes. That way, everyone can share information and access each other's computers."

"Timbuktu/Remote lets me share screens, just like with Timbuktu, over modems or ISDN links."

"I bought PhoneNET CheckNET because it shows me who's on the network and helps me track down problems."

PhoneNET and MacRecorder are registered trademarks, and PhoneNET StarController, PhoneNET Repeater, Timbuktu, Timbuktu/Remote, ScreenRecorder, PhoneNET CheckNET, and TrafficWatch are trademarks of Farallon Computing, Inc. Macintosh and AppleTalk are registered trademarks of Apple Computer, Inc. © 1989 Farallon Computing, Inc. (415) 849-2331.

2201 Dwight Way, Berkeley, CA 94704

Circle 150 on reader service card

"I also got ScreenRecorder because it makes a tape of screen activity, I'll add sound with MacRecorder to make training lessons, presentations, you name it."

PhoneNET

Repeater

Star Controller

TrafficWatch:

"I got a PhoneNET Repeater so I can easily extend my network to all the buildings I'll own someday."

"I bought the PhoneNET StarController because it expands my network and has valuable network management functions, too."

"TrafficWatch tells me who's talking to whom and how much, and what kinds of errors are occurring on the network. 'Add it to the pile', I said."

"I bought the MacRecorder Sound System to add sound to on-screen presentations. It records, edits, and plays back live or prerecorded voice or sound. Wow!"

Farallon*

Networking. Collaborative computing. Multimedia. For Interpersonal communications.

Macworld News

by Tom Moran

Beyond HyperCard

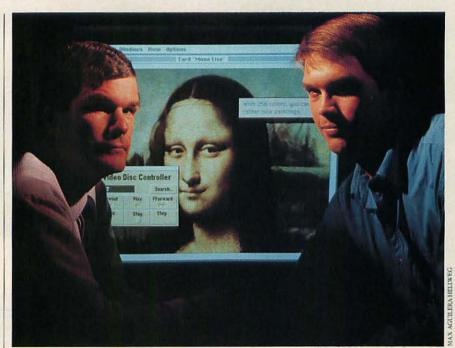


As the popularity of HyperCard grows among developers,

several companies are offering supersets of the HyperCard environment or add-ons for it. Most exciting are two Hyper-Card supersets slated for release in the second quarter of 1989, Silicon Beach Software's SuperCard and Plus from Format Software of Germany both will run existing scripts with little or no modification, and will provide most of the features (such as color support, variable card sizes, objectoriented drawing tools, and an enhanced programming language) that we've been waiting for since HyperCard made its debut. Let's hope that those who program for HyperCard won't have to take a back seat to their Pascal and C counterparts any longer.

While not a superset of HyperCard, Tabularium from All-American Software is a new HyperCard application that makes it easy to quickly move tab-delimited text files into and out of stacks. Although it's not hard to write a script to do the job yourself, the company claims that importing and exporting data is at least 75 percent faster with Tabularium.

Another new add-on product gives HyperCard the ability to work with array variables, a fea-



Charlie Jackson (left) and Bill Appleton (right) developed Silicon Beach's SuperCard, a HyperCard superset with new features such as color support, variable card sizes, objectoriented drawing tools, and an enbanced programming language. Format Software offers a similar superset, entitled Plus. Both programs run existing scripts with little or no modification.

ture near the top of every Hyper-Talk programmer's wish list. CLR HyperArrays from Clear Lake Research provides 24 XCMDs and XFCNs that let you manipulate numeric arrays, sort fields, and test variables to see if they're numeric.

For further information, contact All-American Software Development Corporation in Minneapolis, Minnesota, at 612/537-8910; Clear Lake Research in Houston, Texas, at 713/523-7842; Silicon Beach Software in San Diego, California, at 619/695-6956; or Format Software GmbH in Cologne, West Germany, at 49/221/4972075.—Franklin Tessler, M.D.

Striving for Success



Project Strive, a New York City job-training/ job-placement center

situated near Harlem, teaches more than word processing, data entry, and desktop publishing. A student also learns interview skills, time management, responsibility, how to meet deadlines, and how to work with coworkers and supervisors.

Most of Project Strive's students are on public assistance. Many are school dropouts, single parents without childcare, or people who have been abused by parents or spouses. Students have no prior computer experience.

Project Strive's intensive three-week workshop is a major test of a student's attitude. Working on Lisa, Mac 512K, and Mac 512KE computers, students use a variety of Mac programs to develop skills in real-world projects. For example, each student uses MacPaint to design a flyer. Students also use MacWrite, Cricket Graph, Page-Maker, and ReadySetGo.

Alternating with the computer class is an attitudes/ interview skills class that teaches self-confidence and

(continues)

DRIVE INTO THE FUTURE

Removable • Erasable • Optical • 650 MBytes

REO-650™... the next generation in data storage, is setting a new standard in mass storage and file server technology.

Imagine the capacity of a 650 Mbyte removable optical disk combined with the flexibility to erase and rewrite files up to a million times.

This major achievement in Magneto Optical Technology represents Pinnacle's commitment to the future.

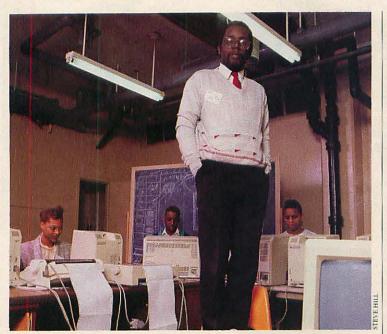
REO-650[™] software drives your Macintosh[™] on LAN, in two directions MAC/OS or A/UX.

Take your drive into the future by calling or writing.

Pinnacle Micro Inc., 15265 Alton Parkway Irvine, CA 92718, USA. in CA (714) 727-3300 FAX (714) 727-1913

(800) 553-7070





Frank Horton teaches at Project Strive, an East Harlem employment service that uses Macs to train people in computer skills.

self-esteem and lets students practice job interviews. A videotape class works on personal interaction and helps students understand teamwork and organization.

Once a student completes the workshop, Project Strive's job placement service steps in to place the student in a job that fits his or her interests. There's no counseling, it's strictly up to the students to decide what they want to do and to stay with it. Graduates are now working in responsible positions at companies such as Merrill Lynch, New York Telephone, and Smith Barney.

Each year 10 to 15 workshops are held at the Harlem location. Over 526 people have graduated, giving the program a remarkable 78 percent success rate. Some graduates have returned to school and even gone on to college.

A nonprofit organization, Project Strive is subsidized completely by private donations from companies such as IBM, Xerox, the New York Times, Chase Manhattan, First Boston, and Bankers Trust. Project Strive does not accept government funding, and prefers to buy its own computers and software. Recently it opened up two new centers, one in the Bronx and another in Pittsburgh.

For more information, contact Project Strive, East Harlem Employment Service, Inc., 173 E. 112th St., New York, NY 10029, 212/369-5500.

—Brita Meng

And Now Presenting...



Two leading Macintosh presentation packages came out with major

upgrades in December. Both include new drivers that let you link the Mac directly with slide services.

Microsoft's update, Power-Point version 2.01, includes a Genigraphics driver and GraphicsLink software. Among other features, the software offers over 5000 Genigraphicsdesigned color schemes and the Genigraphics color palette; even users running PowerPoint in black and white on a Mac Plus or SE can use the palette to specify colors and thus create color slides. Using Graphics-Link, you send completed Power Point presentations via modem to Genigraphics by noon one day, and before noon the following day you receive by courier the finished 35mm slides or transparencies. PowerPoint 2.01 retails for \$395; the Genigraphics driver and GraphicsLink are free to all registered users of PowerPoint 2.0.

Symantec is shipping More II, a complete revision of the popular outliner More that has advanced word processing fea-

You can give on-screen presentations using two Mac IIs, with one computer serving as a status center for the speaker, showing the speaker's notes and a bar chart that times the presentation. The other Mac shows the presentation to the audience. More II includes a driver for sending presentations automatically by modem to MagiCorp, a service that produces slides or transparencies and sends them back by overnight courier. List price for More II is \$395; registered More users can upgrade for \$89.

For further information on More II, call Symantec Corporation in Cupertino, California, at 415/964-6300; for information on PowerPoint, call Microsoft, in Redmond, Washington, at 206/882-8080.—Felicity O'Meara

Mars Venture Fund

Partners with wide experience
Hands-on management style
Risk takers in advanced technology
Long term outlook
Out of this world financial rewards

Microsoft's updated PowerPoint 2.01 includes a new driver that lets you link the Mac with a slide service via modem.

tures such as wrapping headlines, headers and footers, page breaks, automatic labeling, and Microlytic's 100,000-word Spell-Finder spelling checker. The outline processor provides new sorting and organizing capabilities that let you manage information with great flexibility; it also includes style sheets called *Rules*, which format WYSIWYG charts and outlines instantly.

For presentations, you can combine More II—created outlines with files imported from a wide variety of other programs including ThinkTank, MacPaint, Adobe Illustrator, and Microsoft Word, and then add visual effects like wipes and dissolves.

Hot Wires



Northern Telecom now has an \$895 modem available that will

allow data to be transmitted from a Macintosh to a PC at 19,200 bits per second. The University of New Brunswick in Canada is testing it with Timbuktu Remote communications software from Farallon, as well as with Liaison AppleTalk bridging software from InfoSphere. According to John Webster, director of audiovisual services at the university, however, the

(continues)

Built to scale

If you design on a Mac II, a screen that's too small will cramp your style. That's why you should be looking into a Silverview from Sigma Designs.

At 21", this landscape monitor offers the biggest viewing area anywhere. A full 16" x 12" 2-page spread including rulers and margins.

Which means you can finally work in actual size. A fact that's also made possible by SilverView's 72 dots per inch typesetting standard.

Something else should weigh in our favor. The gray scale.

Besides black and white, there are SilverView models offering 16 or all 256 different shades of gray. So what you used to leave up to the imagination can now be in all your work. Like subtle halftones or delicate shadings.

SilverView's also remarkably comfortable to work with.
Its high contrast flat-screen virtually eliminates glare and distortion. And its unusually high refresh rate delivers rock solid images that never flicker.

To find out just how much better your work can look, call Sigma Designs at (415) 770-0100 today.

Then never scale down your ideas.





Sigma Designs, Inc. 46501 Landing Parkway Fremont, CA 94538 Northern Telecom's \$895 modem transmits data from a Mac to a PC at 19,200 bits per second.



modem can't be used with Red Ryder communications software. Although 19,200 bps does appear as an option in Red Ryder's configuration menu, it isn't supported, he said. (A 19,200-bps bidirectional data link, which utilizes a voice-data multiplexer, is reportedly part of the Central Office LAN service available from certain Bell operating companies. However, the service apparently isn't offered in all areas.)

For more information call Northern Telecom in Richardson, Texas, at 214/437-8000. —Sharon Fisher

A Calculator for the Page Designer

The marriage of traditional and desktop publishing methods is not without conflict, confusion —and lots of calculation. To ease some of the problems, a graphic designer for American Demographics, a 95 percent desktop-published magazine, has developed a HyperTalkbased program for calculating enlargements and reductions of photographs and illustrations. Designer John Parsons wrote GraphiCalc so that he could translate traditional printer's picas into PostScript picas online.

Before writing GraphiCalc, Parsons struggled through the following steps: (1) measuring photos and illustrations in printer's picas; (2) converting printer's picas to decimals of inches; (3) switching the Post-Script pica default on his page layout program to inches; (4) entering the decimals of inches; (5) switching back to the PostScript default on his page layout program; (6) entering the percentage enlargement or reduction desired.

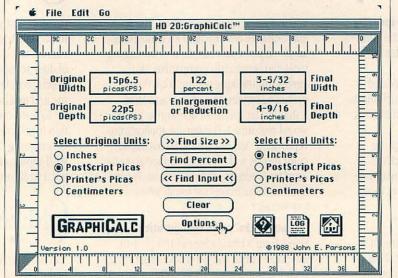
GraphiCalc has enabled Parsons to convert from original measurements to final reductions or enlargements—using only one HyperCard screen. He estimates that he can now do ten such conversions in the time he formerly spent doing one. GraphiCalc also lets him enter original and final measurements first, and then calcu-

late the percentage of enlargement or reduction required.

A third GraphiCalc calculation compensates for the size distortion that often occurs with plain-paper laser printers. If your printer is not perfectly accurate, you can print a document, measure its inaccuracy, and then type the name of the printer and the inaccuracy measurement into your GraphiCalc stack. From then on, you can select Find Input, and the program will compensate to produce WYSIWYG output.

GraphiCalc will also create a file that logs all of your calculations, so you won't have to constantly move back and forth between computer and paper. Then you can save the file and print it out later when it's time to jot down the new measurements on the back of your photos or illustrations.

GraphiCalc requires Hyper-Card and will run on any Mac with 1MB of RAM, but running it in tandem with another application requires at least 2MB. (Parsons has 5MB and uses GraphiCalc with PageMaker and Adobe Illustrator running all at once under MultiFinder.) For further information, contact ProGraphics, P. O. Box 6856, Ithaca, New York; 607/277-0916.—Ann Garrison



GraphiCalc, a HyperTalk-based program, belps page designers calculate enlargements and reductions of photos and illustrations.

E-Mail Support Grows on Vines

Banyan Systems recently announced a Mac electronic-mail gateway that links its own VINES Network Mail with CE Software's QuickMail. Now users of IBM PCs and compatibles can send E-mail and file attachments to Macs over the VINES network.

The VINES Mac Mail Gateway program has two components: the listener, which runs as a VINES service on a Banyan server; and the bridge, which runs with the QuickMail Administrator program on a Mac. Users of VINES Network Mail or QuickMail do not need to know the location of the gateway or of the receiving system; the gateway uses VINES's network-wide naming and addressing scheme to deliver mail transparently.

The bridge and listener software communicate using AppleTalk protocols, which are supported in version 3.10 of VINES Network Mail. Macintoshes must be connected to the VINES server via Ethernet either directly (with an add-in board such as Apple's EtherTalk) or through an Ethernetto-LocalTalk bridge (such as Kinetics' FastPath).

VINES, a network operating system based on UNIX System V, integrates dissimilar local area networks, wide-area networks, and minicomputers and mainframe computers. Earlier versions of VINES-supported networks include IBM's Token-Ring, 3Com's EtherLink, Ungermann-Bass's Net/One, and public data networks that run the X.25 protocol. Now that Apple-Talk networks are supported in VINES, Macs can also be in-

(continues)



A friendly face in a tough, place

RackMac" brings Macintosh* to industry

Now the friendliest computer in the office is also the most practical computer for industry.

Introducing RackMac, a ruggedized Apple® Macintosh II computer which meets the special needs of the industrial systems integrator.

The Macintosh II is an outstanding desktop office computer. And RackMac provides the added strength and real-time I/O capabilities to make it effective in an industrial environment.

A comprehensive solution

Frankly, building an industrial computer requires more than just a face lift. That's why GreenSpring has taken a comprehensive approach in providing the right industrial computing solution.

GreenSpring provides rugged easy access rackmounting cabinetry, enhanced cooling,

and industrial grade connectors. The Rack-Mac Software development kit contains example source code, scripts, and debugging tools and is naturally compatible with Apple's multitasking realtime distributed operating system, HyperCard, and MPW. A step-by-step guide for developing professional real-time I/O intensive applications is provided. Add our industrial packaged color display with optional surface acoustic wave touchscreen, and you can easily see how RackMac makes the tough jobs a touch easier.

IndustryPacks™ make configuration a snap Select from a broad range of I/O plug-in interfaces called IndustryPacks supporting

such interfaces as OPTO 22, IEEE-488, A/D, D/A, serial, printer, relay, and others.

Then snap those IndustryPacks onto your choice of NuBus IP carrier. The low cost SupportBoard provides routine I/O ex-

pansion. But perhaps RackMac's most impressive feature is SpringBoard, a 68020 based I/O controller with its 1 or 4 Mbytes of dual access RAM and NuBus mastership, which provides true realtime I/O multitasking and pipelined multiprocessing.

To learn more about the RackMac solution to your industrial application, call GreenSpring Computers at 1-415-364-8700. We'll show you how our friendly face can put a smile on yours.



558 Brewster Avenue Redwood City, CA 94063 (415) 364-8700 FAX (415) 369-5982

Authorized Value Added Reseller

Circle 430 on reader service card

cluded. In addition, Macs can take advantage of other VINES mail gateways—for example SoftSwitch's PROFS mail gateway to IBM mainframes.

Jointly developed with Star-Nine Technologies of Berkeley, California, the VINES Mac Mail Gateway is actually a port of StarNine's Mail Link Gateway, which bridges Mac mail programs and UNIX Mail. Banyan selected QuickMail as the Mac front end because it was the only available mail package that supported mail gateways. Banyan plans to ship the gateway in April for \$795 per server.

VINES's support of AppleTalk protocols will make it easier to further integrate the Mac into the VINES network while maintaining the Mac interface. Future services will include file and printer sharing, and mainframe/minicomputer gateways.

For more information, contact Banyan Systems, in Westboro, Massachusetts, at 508/898-1000.—*Brita Meng*

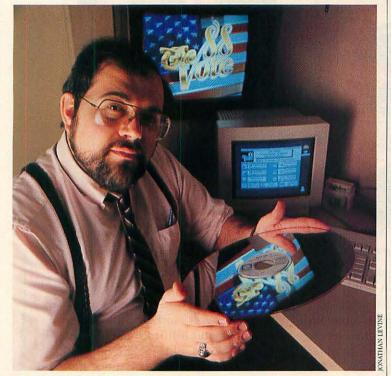
ABC's Interactive News



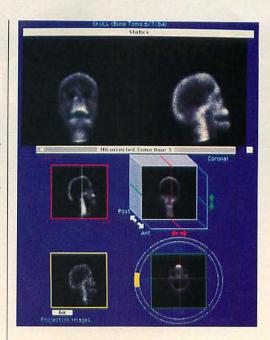
Last year's presidential election may lead to a revolutionary use of la-

ser disk technology. During the campaign ABC's Peter Jennings used an 18MB HyperCard application consisting of nearly 200 stacks with thousands of detailed cards on candidates, voting records, issues, and so on. The application, called Magna System: The '88 Vote, won Macworld's 1988 SuperStacks contest and made ABC so happy that the network has created a team to develop interactive video with HyperCard and archival ABC news film footage on laser disks.

ABC's first product in its planned *Instant Replay of History* series is a modification of the application Jennings used. Called *The '88 Vote: Campaign*



ABC's David Bohrman shows off a laser disk of '88 election news footage, which can be accessed with a HyperCard stack.



Cranial bone scan displayed by Report and Image Management System (RIMS), a Mac II-based system for nuclear medicine imageviewing and reporting developed by Medical Image Processing Specialists (MIPS).

for the White House, the new application allows you to access not only thousands of cards but also 108,000 frames of election news footage. Want to review the honor or infamy bestowed upon a "card-carrying member of the ACLU"? The assaults and counterassaults over who did the damage to Boston harbor? Click on a few buttons and presto—a year's worth of news footage is at your command. You can also click for commentary by ABC's political analyst Hal Burns, for an ABC news overview of an issue, or for the candidates' commercials. One 30-minute side of the laser disk contains footage leading up to and through the conventions. the other follows George Bush and Michael Dukakis through the final stretch.

The network's interactive video team is still so new that it hasn't yet settled on its next subject, but with all the historic film footage archived at ABC, there are plenty of options. In most cases, the primary markets will be educational. "The teacher or the student can become the anchorman," says the program's creator, ABC producer David Bohrman. They will be able to use the programs to create their own doc-

umentaries or satires—so long as they don't credit them to ABC.

The ABC product requires a Mac Plus or higher system with 1MB of hard disk space, a laser disk player with a serial interface, and any standard television monitor. The '88 Vote: Campaign for the White House will cost under \$400 including the laser disk, the HyperCard stack, and a guidebook to its contents. For further information, contact the product distributor, Optical Data Corporation, in Florham Park, New Jersey, at 800/524-2481.-Ann Garrison

A Better Image



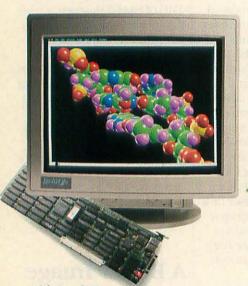
The Macintosh is continuing to make inroads into medical

imaging. At last November's meeting of the Radiological Society of North America, health professionals saw a wide spectrum of Mac-based applications, ranging from image analysis to education. One reason

(continues)

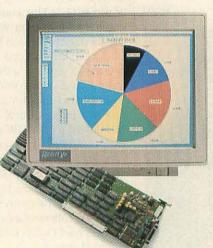
Only RasterOps...

Gives You All The Color Choices



ColorBoard 108 RasterOps 1948S 19" Trinitron Monitor

For layouts, color comps, desktop publishing, CAD/CAM or slides for your next business presentation you need access to 16.7 million colors. Our 8-bit ColorBoard is the ideal match for Quark XPress, Aldus Persuasion, Cricket Presents and other Mac II software. Multi-resolution allows you to run 19" hi-res Trinitron monitors, 16" monitors and Apple 13" monitors, all in WYSIWYG.



ColorBoard 100 RasterOps 1648S 16" Trinitron Monitor

For graphics and video, ColorBoard 100 is a powerful 8-bit enabler. Open the door to presentation graphics, desktop publishing and video applications. You can scan in an image, design with it and output to a color printer, film recorder, or using NTSC or PAL standards, output to a VCR.



ColorBoard 104 RasterOps 1948S 19" Trinitron Monitor

For uncompromising applications—polished comps, color separations, pre-press—24-bit color is a must. Hi-res ColorBoard 104 delivers photographic brilliance and realism on Sony, Mitsubishi, Seiko, Taxan and other leading monitors. Using software like LaserPaint Color II, Canvas 2.0, Spectra Match and Spectra Print, get mainframe performance at a fraction of the cost.

And No Regrets:



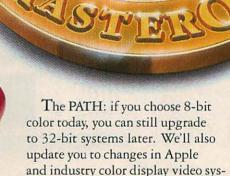
ColorBoard 64 Apple 13" Monitor

Graphic design and video benefit from 24-bit color with ColorBoard 64. Work with photographic quality images on your monitor, then record them on a VCR using NTSC video output. Perfect for all Mac II graphics and video production packages—like VideoWorks II.



FrameGrabber 324 RasterOps 1948S 19" Trinitron Monitor

Capture images, live via video camera, or from recorded media in NTSC, S-Video or RGB video formats with the FrameGrabber 324 video digitizer. It makes digitizing and manipulating photo-quality video images for graphic design, desktop video or CAD/CAM easy.



Only RasterOps offers this norisk PATH to state-of-the-art color! *Guaranteed*.

Call today: (408) 446-4090 For your local RasterOps dealer.

Raster Ops

tem standards.

10161 Bubb Road, Cupertino, CA 95014 Fax (408) 446-4168 We're changing the way people look at computersTM

If you're concerned that \$399 is too little to pay for the new Ehman 20 MB Hard Drive, we'll give you 30 days to change your mind.



EHMAN H	ARD DRIVE	E PHICES
Size (Mb)	Internal	External
20	NA NA	\$399
30+	\$449	\$499
45+	\$549	\$599
65	NA	\$649
85	NA	\$749



The Ehman 20 MB Hard Drive is vivid proof that you don't always get what you pay for...sometimes you get more. At just \$399 the Ehman drive is significantly less than the leading 20 MB drives on the market. But please don't judge us by our price.

True value is based on *performance* and price, and the Ehman drive really hums. It is built upon Seagate technology for optimal speed and reliability. And while it includes all the usual utility software and necessary cables, it may be what's <u>not</u> included that you'll appreciate the most...noise. In fact the Ehman drive provides virtually noiseless performance.

You may be wondering how we can provide so much for so little. The simple answer is excellent engineering and an obsession with efficiency. Ehman has been a leading OEM manufacturer of Macintosh peripherals since 1985. We know how to design better Macintosh peripherals. And we keep the overhead low and the margins thin so we can provide our customers with the very best values.

In case you're still not convinced we'll give you 30 days to return your purchase with no questions asked. In addition we back our products with a two-year warranty, compared to as little as 90 days for some manufacturers. Ehman drives are compatible with the Mac Plus,™ Mac SE,™ and the Mac II™ and come in a variety of sizes. Larger drives are available at equally attractive prices. So call 1-800-257-1666 today or order by FAX at 307-789-4656 for the best value in Macintosh peripherals. Ehman calling hours are 9:00 A.M.−9:00 P.M. EST Monday-Saturday.

All product names mentioned are trademarks of their respective holders.

for the Mac's growing popularity is cost: even after last year's price hikes, Mac II workstations are a bargain compared to similar systems costing ten or twenty times as much.

During the presentations of Macintosh imaging applications, Automatix showed software that provides sophisticated edge detection and image enhancement. Medical Image Processing Specialists (MIPS) demonstrated a Macintosh II—based system for nuclear medicine image-viewing and reporting.

For further information, contact Automatix in Billerica, Massachusetts, at 508/667-7900 or MIPS in Ann Arbor, Michigan, at 313/665-5400. For more information on the Macintosh presentations, call me at UCLA, at 213/825-8813.—Franklin Tessler, M.D.

New BackPac Plus Modem



Jasmine's new version of BackPac is a small miracle of compact-

ness. The hard disk clamps right onto the back of the Mac and fits into standard Mac carrying cases. It saves not only space but also the SCSI port; you plug a cable into the power outlet and into the drive, plug the drive into the power socket on the back of the Mac, and leave the SCSI port free for other peripherals. The BackPac becomes the back of the Mac and its on/off switch replaces the one on the Mac.

All this space-saving cuteness was there in the first Back-Pac, but the new version can also support an internal modem to save even more space. You just fit Jasmine's 2400 Talk-Bac modem right into the Back-Pac and let it draw power from



Jasmine's new BackPac bard disk fits right onto the back of the Mac Plus or SE.

inside. If you purchase a base with the modem, you can also remove it from the drive and use it as a stand-alone unit.

The old BackPac was a 40MB drive for the Plus only; the new one works with either the Plus or the SE and comes with 20MB. 45MB, 70MB, or 100MB of storage. If ordered directly from Jasmine, the BackPac costs \$629 for 20MB, \$879 for 45MB, \$1079 for 70MB, and \$1479 for 100MB. The TalkBac modem costs \$199 alone, \$269 with the base for stand-alone use. For further information, contact Jasmine Technologies, in San Francisco, California, at 415/282-1111 or 800/347-3228.

-Ann Garrison

GunShy in Color



The Gold Coast Macintosh Users Group is distributing Hot Disk

36, which includes a color version of GunShy, the shareware solitaire tile game.

GunShy is very similar to Shanghai, another game in which you attempt to match pairs of tiles and remove them from a five-layer pyramid of tiles. GunShy's tiles, however, are decorated with familiar icons from the Mac, popular applications, and games such as Crystal Quest. The icons seem easier to recognize and match than Shanghai's mah-jongg tiles. The color version of GunShy has only a few color icons, such as the hand on the red stop sign and the yellow triangle with the exclamation point. Color is also used to highlight the tiles according to which layer of the pyramid they're on.

Hot Disk 36 also offers a Goplaying program, a darts game, and a demo of MacCD—a CD ROM "audio studio" and library of sounds. The demo, featuring sounds from "Star Trek," lets you replay audio highlights from the show—including the

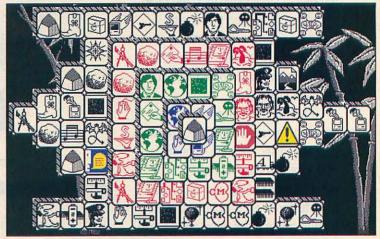
keystroke; and Anonymity, which enables you to change the registered user name on certain applications. Hot Disk 36 costs \$7 for members and \$10 for nonmembers. For more information, call the Gold Coast Macintosh Users Group in Miami, at 305/447-7888.

C++ and MacApp 2.0



Responding to a strong interest voiced by developers, Apple has

implemented C++ for the Macintosh. A beta version of the object-oriented programming lan-



Hot Disk 36, from the Gold Coast Macintosh Users Group, features GunSby, a game played with tiles decorated with Mac icons.

sound of the high-tech doors opening. Clearly, the demo sounds were chosen for installation as system cues—for instance, you hear the doors opening when you start up; Mr. Spock says "I cannot obey your order, Captain" when you make an incorrect command; and he says "Live long and prosper" when you shut down.

The disk also offers Anti-Virus 1.03E, billed as removing nVir and immunizing against it; a HyperCard utility for creating text fields that scroll with one guage designed by AT&T is now available through Apple Programmer's and Developer's Association (APDA). A final version will be available after AT&T finishes defining the language, probably later this year. Apple plans to create a set of interfaces between MacApp and C++ to allow existing MacApp objects to be used as a basis for further development in C++.

MacApp 2.0, a new version of Apple's object-oriented Pascal programming library, has sev-

(continues)

Tools of the Trade

QuarkXPress™ makes your
Macintosh a powerful design and
production system... with features and
capabilities that address the real-world
needs of today's graphic arts professional.

It's the right tool for anyone who cares about fine typography and layout accuracy. Such as support for global tracking in increments of 1/200 of an em space. Or leading that can be specified as precisely as 1/1000 of a point. In short, the kind of precision that designers have come to expect in excellent typesetting.

And when it's time to put your design on press, QuarkXPress makes your job easier. Because Version 2 now supports the PANTONE®* MATCHING SYSTEM and advanced color features. So moving your idea from tissue to mechanical art will take a little less time. And a lot less effort.

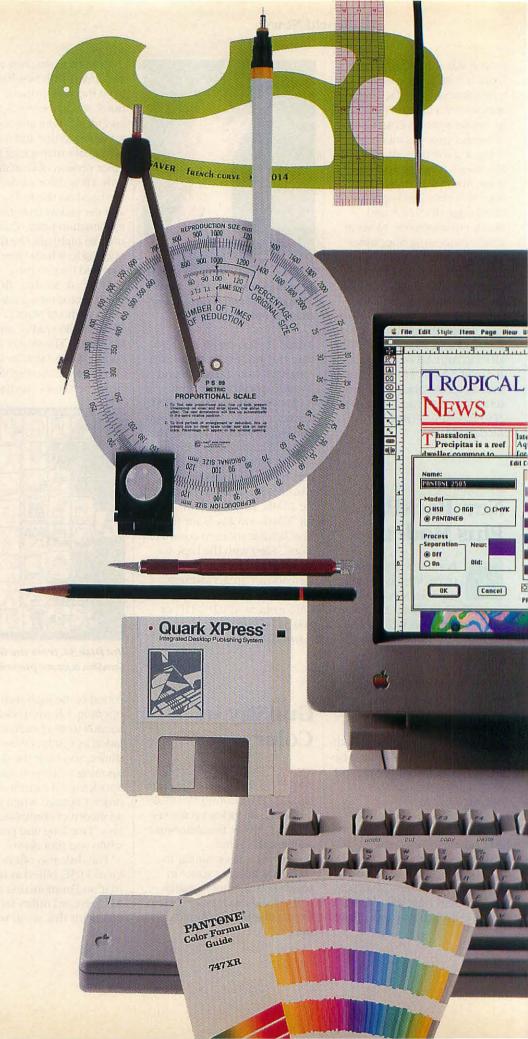
To learn more about QuarkXPress and see a demonstration, call 1-800-356-9363. Or see your authorized Quark dealer.



Quark and QuarkXPress are trademarks of Quark, Inc.

*PANTONE is a registered trademark of Pantone, Inc. Pantone Inc.'s check-standard trademark for color reproduction and color reproduction materials.

Circle 295 on reader service card



MPW 3.0, the newest version of Apple's principal programdevelopment system, features performance improvements and new options.



eral new attributes. It has a simplified architecture that makes it easier to have windows and dialog boxes work together. Views can now be built graphically from component objects: a view editor automatically creates the necessary resources that MacApp procedures use to draw and manage a view. Mac-App 2.0 can also create applications that work in the background under MultiFinder. In addition, a new object-inspector feature discloses the properties of objects. Data sheets and MacApp itself are available from APDA.-Lon Poole

Developer Developments

Programmers can now get new or newly revised Macintosh program development products from Apple, including the Macintosh Programmer's Workshop (MPW) version 3.0.

MPW 3.0, the newest version of Apple's principal Macintosh program-development system, features performance improvements along with new options such as Projector, a set of commands for managing a software project; SADE (Symbolic Application Development Environment), a new source-level debugging environment; and a completely new C compiler. There are new tools for selecting AppleTalk network services

from the command line, sorting lines in a file, and creating HyperCard XCMD and XFCN resources. Users can run all MPW 3.0 tools in the background via MultiFinder and also share them over a network file server. MPW is available in various configurations through APDA, and is included with many programming languages sold by third parties.

Projector helps control and track changes to source code, documentation, and any other files associated with a softwaredevelopment project. A member of the development team can check out files to prevent other team members from changing them until the files are returned. Projector maintains the revision history of a project's files in a tree structure, so that anyone can create a new branch without affecting primary development work. Projector can rebuild a version of the project that existed on a particular date.

SADE lets programmers debug programs at the sourcecode level. It works with the new versions of the MPW Pascal and C compilers and with the MPW assembler. Other vendors have announced SADE support in new versions of their compilers, including Absoft Mac-Fortran/MPW, Language Systems FORTRAN, SemperSoft Modula 2, and TML Pascal II. SADE features multiple windows, changeable menus, and a scripting language. Predefined menus let vou set breakpoints, single-step, view variable values, and dump structures with format intact. The scripting language has its own variables and control commands so you can run extensive tests automatically, set up interruptable test procedures, and control the debugging environment. SADE runs under MultiFinder separately from the program being debugged.

The new C compiler in MPW 3.0 contains American National Standards Institute (ANSI) C features such as function prototypes and strong type checking, as well as ANSI C additions to the standard library.

—Lon Poole

APDA Turnover

Apple has taken over operation of APDA, the membership organization that sells program development languages, tools, utilities, and documentation from Apple and other companies.

Apple plans no major changes in APDA. The organization's quarterly publication, *APDAlog*, will be redesigned to make product descriptions easier to read. Also, Apple will control manufacture of Applelabel products distributed by APDA. But for most of the

21,000 current members, the chief adjustment will be new addresses and phone numbers: APDA

Apple Computer, Inc. 20525 Mariani Ave., M/S 33G Cupertino, CA 95014 800/282-2732

Telex: 171-576 Fax: 408/562-3971 AppleLink: 2732 CompuServe: 766,2045

MCI Mail: Postrom GEnie: XTX03077

Annual membership fees are \$20 in the United States, \$25 in Canada and Mexico, and \$35 for all other countries. All existing memberships remain valid until their expiration dates.

—Lon Poole

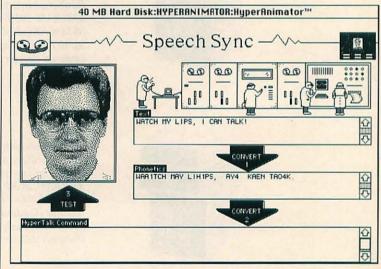
HyperAnimator



"Hello, this is your mother," says the image on your computer

screen. Looks like Mom and talks like Mom, though her lips move a bit jerkily and her voice suffers slightly from digitization. Is this a sweet dream or a nightmare? Either way, Bright-Star Technology has the soft-

(continues)



HyperAnimator makes on-screen characters talk; you can scan the faces in or choose from a stable of nine "actors" included in the program.

93

Varityper a Tegra Company De P



Supplier of Imagesetters with Adobe's PostScript® Interpreter

Whether you want your output on plain paper or photo-media, Varityper is the #1 choice for PostScript Imagesetters.

#1 in Product Line Giving You the Broadest Choice

Varityper is the only supplier to offer a choice of four high-resolution imagesetters with Adobe's PostScript interpreter: two with 600 dpi plain paper output . . . the VT600P for up to $8\frac{1}{2}$ " \times 11" sheets and the VT600W for up to 11" \times 17" sheets . . . and two with photo-media output . . . the 4200P for 1200 dpi and the 4300P for 1200 to 2400 dpi. All the choices for your precise needs.

#1 in Technology

Varityper uses laser diode technology to produce smaller, lighterweight, less costly and more reliable imagesetters. And, Varityper's PostScript imagesetters employ FULL-PAGE BUFFERING to provide higher quality, higher speed and greater precision than other imagesetters.

#1 in Price/Performance

In head-to-head comparisons, our PostScript imagesetters are competitively priced and the fastest on earth! Varityper is the #1 choice when you can't afford to wait and you want to pay less.

#1 in Price/Quality

No matter what your needs, Varityper has an imagesetter which will give you the best resolution per dollar and the accuracy of systems that cost 1/3 more! Varityper full-page processing avoids the inevitable banding problems associated with other imagesetters

which employ partial page processing "start/stop" schemes. #1 in Flexibility

Varityper imagesetters come complete with Apple LocalTalk, a Centronics parallel and RS-232 serial ports giving you the choice to use an Apple Macintosh, any IBM or compatible microcomputer or other publishing system using any software producing PostScript format output (e.g. PageMaker, XPress or Ventura Publisher). You can even use any vendor's PostScript-formatted type faces. With Varityper you can handle a multitude of applications. You are governed by the job and not by the limitations of the equipment.

#1 in Reliability, Service and Support

Sound technology has made Varityper imagesetters simpler and more reliable. And, our unparalleled dedication to our customers has made us the industry leader in service and support. That's one of the reasons Varityper customers stay Varityper customers. No matter what your needs . . . whether it's the VT600P or VT600W for plain paper proofing or final production of forms, brochures, newspapers or newsletters; or it's film-based higher resolution output for ads, books, magazines or yearly reports with the 4300P and 4200P . . . Varityper has the PostScript imagesetters to help you create more effective communications.

For more information about any of Varityper's full line of PostScript imagesetters, call today.

1-800-631-8134

(In New Jersey 201/887-8000 x-999)

Varityper

Circle 93 on reader service card

"The perfect place to put your computer to work."

- Apple Computer

That's what Apple had to say about MacTable in their Apple Collection catalog.

It's also the only table chosen for The Apple Collection. And for good reason, Because MacTable isn't just a computer stand, it's a fullfledged workstation built around the Macintosh.

It has a place for everything. Hard disk, second drive, modem, keyboard, mouse, ImageWriter, and LaserWriter. Yet even with a full complement of gear, there's room to spread out for serious work.

Every surface interchangeable

Each of MacTable's four surfaces can be independently tilted and interchanged to fit every Mac made: Plus, SE, or Mac II. You can even make it right- or left-handed. So it accommodates any peripheral you'll ever have at comfortable working and viewing angles.

Stands the test of time

MacTable is meticulously built by craftsmen using pure beechwood and durable laminates. Its sturdy design and quality materials support



Interchangeable surfaces offer configurations for every size Mac.

even the heaviest equipment. And MacTable's platinum gray surfaces match Mac equipment perfectly.

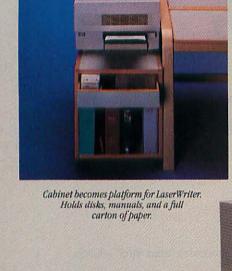
Matching roll-away cabinet

The free-standing cabinet (optional) is big enough to use as a stand for your LaserWriter or CPU. It features easy-glide locking casters and space for full-size binders. Plus a whole carton of paper. A special place in the locking drawer holds over 100 disks upright and secure.

A great price

MacTable is an incredible value. Just \$289 when you buy directly from ScanCo. Add the sturdy matching cabinet for \$139 more. And if you're not satisfied with MacTable for any reason, return it for a prompt refund (less shipping).

Before you buy an ordinary table for your Macintosh, think again. Then get the table Apple chose.





The ultimate Mac peripheral.



To order your MacTable or for more information call:

TOLL FREE (800) 722-6263 in WA state (206) 481-5434 Prices do not include U.P.S. shipping.

Circle 296 on reader service card

· Dimensions: 60"W x 30"D.

Macworld News

ware to make it come true. The company's HyperAnimator lets you paint or scan in faces and then type whatever you want them to say; the text is automatically converted to speech synchronized with the lip movements. Mom's voice won't sound like hers, however, unless you can get her to digitize it and give you the disk. If you simply type in her words, she'll sound distinctly computerish. If you don't have time to draw or scan faces, you can use the stable of nine characters provided by BrightStar.

HyperAnimator's best advance man, however, is probably Albert, a talking head starring in Disney's new version of "The Absent-Minded Professor," seen on Sunday nights as part of "The World of Disney" TV series. Software developers Jay Johnson and Harry Anderson created Albert to play the professor's electronic sidekick.

BrightStar has also added the HyperAnimator's audio feature to an E-mail package called HyperMail, which lets your animated coworkers deliver their messages in persona.

HyperAnimator lists for \$149.95. For further information, contact BrightStar Technology, in Bellevue, Washington, at 206/885-5446.

-Ann Garrison

TokaMack

The U.S. Department of Energy is betting on a Columbia University

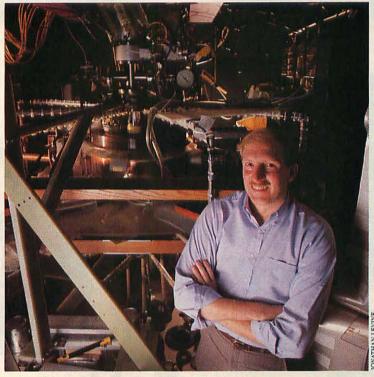
laboratory team that uses a Mac in its search for safer nuclear energy. The team, led by Assistant Professor Michael Mauel, is testing the effectiveness of using magnetic force fields to confine hydrogen plasmavery hot, ionized gasesheated to temperatures above 1 million degrees. The plasma created in the experiments

looks like rings of lightning and lasts for 200 millionths of a second each time it appears. During every flash of the lightning ring, laser beams and magnetic sensors measure the dynamics of the ring at least once every millionth of a second, producing more than a megabyte of data.

The data is digitized, loaded into VAX computers, transferred to Macs, and then analyzed with TokaMack, an application Mauel wrote using Apple's Macintosh Programmer's Workshop (MPW) and MacApp. The analysis also involves four Cray comtohydrodynamic instabilities, called kinks, occurring in the plasma ring at very high pressure.

TokaMack is named after Tokamak, an earlier device developed by the late Russian physicist L. A. Artsimovich for magnetically confining ring lightning. Mauel offers the software as freeware to scientists doing similar research throughout the world. TokaMack requires a Mac II.

For further information, contact Michael Mauel at Columbia University, at 212/854-4455. -Ann Garrison



Columbia professor Michael Mauel leads a team using Macs to test the use of magnetic force fields to confine bydrogen plasma.

puters located at the Lawrence Livermore National Laboratory in California and networked to the Columbia lab's VAX and Macs with a high-speed, national satellite link.

Mauel and his graduate students have used TokaMack and the data from their experiments to create the first illustration of the structure of magne-

No Excuses

Shareware users now have a more convenient way to do the right thing and pay for it. And not a moment too soon when you consider that only an estimated 5 percent of the fees owed to shareware developers are ever received. Users of the Connect Professional Informa-



tion Network (accessed from the Mac with MacNet software) can now download shareware, register it, and be billed on their monthly statements.

Shareware programs, available in the Mac Symposium public forum, are still available to users for downloading and perusal. However, a folder of registration forms is now available for users who choose to keep a shareware program. All you need to do is download the appropriate registration form, fill it out, and E-mail it back to the authors or their representatives at Connect. Big brother still can't see you—unless you download the registration form, there is no way to determine whether you've kept a program or not.

Shareware authors receive monthly checks equal to 60 percent of the fees collected for their shareware over the billing period. Connect takes a 30 percent cut, and Mac Symposium keeps 10 percent to cover administrative costs. Mac Symposium operators hope that this system will increase the number of users who actually pay for shareware, help maintain the high quality of shareware offerings, and reform computer scofflaws everywhere. For more information, call Connect, in Cupertino, California, at 408/973-0110 or log on to the Mac Symposium on Connect. -Liza Weiman

(continues)

Develop your ideas in Digital Darkroom.

A classic arch becomes the anchor for this surreal composition. After eliminating unwanted areas, a stairstep design is added.

2 After being cut from its background, a skyscraper is added. A false bottom is created with simple retouching.

With the help of automated paste controls that replace tedious pixel editing, the waves wrap around the arch.

4 Using brightness and contrast controls, dramatic clouds are salvaged from an underexposed original and then pasted into the background.

5 Finally, the children step out of an otherwise ordinary photo — with the help of the Magic Wand automatic selection tool — to add the key dramatic element to the composition.

Imagine a computerized darkroom...in your Macintosh.® Software that gives you more control over grayscale images than even the most skilled photographer. That's Digital Darkroom.™

Unique "intelligent" tools eliminate much of the work in creating dramatic compositions, whether you're a beginner or a professional. You can automatically select objects using the Magic Wand, or blend one image into another with simple slider controls. You can freely slant, stretch or rotate your image to get precisely what you want.

For detailed retouching, you have brushes and filters that blur, sharpen, smudge or create complex textures and other special effects. You can even outline shapes in your images automatically with AutoTrace.[™]

Circle 266 on reader service card

And when it's just right on-screen, the exclusive Advanced Halftone printing option will give you the smoothest grays and sharpest detail you've ever seen on a 300 dpi laser printer — even on non-PostScript® language printers.

From simple retouching, to the wildest flights of imagination, develop your ideas — in Digital Darkroom.

Suggested retail price: \$395. Special introductory price: \$295.

System requirements: Macintosh Plus, SE or Macintosh II

Silicon Beach Software, Inc. 9770 Carroll Center Road, Suite J San Diego, Ca 92126 • (619) 695-6956

Digital Darkroom and AutoTrace are trademarks of Silicon Beach Software, Inc. Macintosh is a registered trademark of Apple Computer, Inc. PostScript is a registered trademark of Adobe Systems Inc.



SILICON BEACH

Here Come the Cards



Now that the new SE/30 supports color, third-party color video

cards are on the way. Among the first is SuperMac's Spectrum/8 Series II. It has a 16.8million-color palette and 1MB of VideoRAM that can be set for 1-, 2-, 4-, or 8-bit color or gray scale. The card now supports Apple's 12-inch gray-scale monitor, Apple's 13-inch color monitor, and a series of Super-Mac displays including a 19inch Trinitron color monitor, a 19-inch standard color monitor. a 16-inch Trinitron color monitor, and a 19-inch gray-scale monitor.

The Spectrum/8 Series II also supports side-by-side operation of both an add-on monitor and the SE/30's monitor. The new card will represent a virtual screen much larger than that of the monitor's actual screen; virtual screen sizes are 4096 by 1792 pixels at 1 bit per pixel, 2048 by 1792 at 2 bits,

2048 by 896 at 4 bits, and 1024 by 896 at 8 bits. Pan and zoom features let users automatically pan across the entire virtual screen and zoom in on views enlarged by a factor of two, in all modes.

The Spectrum/8 Series II lists for \$1895. For further information, contact SuperMac, in Mountain View, California, at 415/964-9694.—Ann Garrison

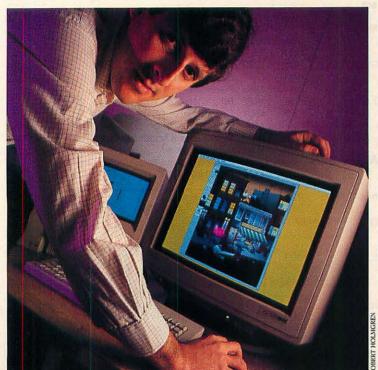
New MacWrite and MacDraw



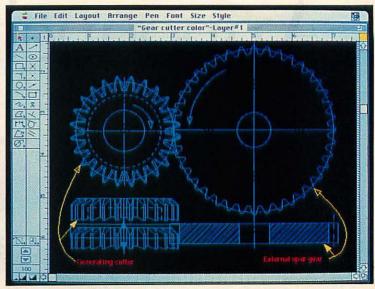
Claris Corporation's software developers have been hard at it: in

February the company released MacWrite II, its new version of MacWrite, and MacDraw II 1.1. The company also unveiled Claris CAD in January, and its SmartForm Series in December of last year.

MacWrite II has more than 50 new features, including mail merge and extensive online



SuperMac founder and chief scientist Steve Edelman headed the team that developed the first color card for the SE/30.



Claris CAD is a 2-D design and drafting tool with a customizable drawing environment.

help. It lets you create up to 30 custom type styles by selecting the font, size, special attributes, and even color that make up each style, and then adding each style to the menu for later use. The program also lets you exchange files with five other popular word processors without translation to and from ASCII; the special characters are automatically translated.

MacWrite II lists for \$249, with the upgrade cost depending on which version of Mac-Write users already have.

MacDraw II 1.1, the upgrade to Claris's drawing package, includes the power to create multiple, overlapping transparent layers within files; the layers can be hidden, shown, and rearranged in any order. For example, the foundation, framing, roofing, and wiring of a house could all be layers within one file.

Claris has also incorporated a slide manager for previewing, sorting, and showing slides and printing handouts for presentations. Also new are on-screen stick-on notes (like Post-it notes) that can be hidden or shown, printed or not printed. The program also offers export capabilities through the PICT2 format, for transferring color graphics from one file to anoth-

er without using the Clipboard. MacDraw's list price is \$399; registered MacDraw II 1.0 and original MacDraw owners can upgrade to version 1.1 for \$25 and \$200, respectively.

Claris CAD is a 2-D design and drafting tool that features a customizable drawing environment, automatic dimensioning with associative redimensioning, and the power to import and export files in PICT, IGES, or DXF formats. It lists for \$799 including a tutorial videotape and workbook. The IGES and DXF translators are optional at \$299.

The SmartForm Series includes two applications for easing the pain of paperwork. You can use SmartForm Designer to create forms such as expense reports, invoices, tickets, and mailing labels; and SmartForm Assistant to fill out forms created with SmartForm Designer. SmartForm Designer lists for \$399, including a single-use copy of SmartForm Assistant. SmartForm Assistant lists for \$49 for one copy, \$399 for ten copies, or \$500 for a 100-user license.

For further information, contact Claris Corporation, in Mountain View, California, at 415/960-1500.—Ann Garrison

Announcing another

Hold on to your hats! Hold on to your feet! And hold on to your original packaging and documentation! Because, MacConnection is now offering 30 and 60 day money-back guarantees on selected items. If you are dissatisfied with your purchase of these products for any reason, just call for a return authorization. Look for the red stars * which indicate participating companies.

We only carry the latest versions of products. Version numbers in our ads are current at press time. Also, all of the software we sell is not copy-protected, unless indicated otherwise by (CP), which denotes that it is copy-protected.

The four-digit number next to each product is the product's ITEM NUMBER. Please refer to this number when ordering. Thank you.

SOFTWARE

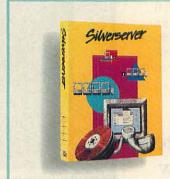


Chang Labs ... 60 day MBG

C.A.T. Special-Intergrates database, mail merge, & appointment calendar into one powerfully fast tool. Purchase C.A.T. before April 30, 1989 and receive a copy of Bravo's award-winning MacCalc spreadsheet FREE! \$229.

ACCOUNTING & FINANCE

*	Aatrix Software 30 day MBG	
3976	Aatrix Payroll 3.05	99.
4020	Aatrix TimeMinder 1.7	109.
3958	Aatrix Payroll PLUS 3.02	159.
1	Chang Labs 60 day MBG	
1613	Rags to Riches Ledger 3.1	120.
1614	Rags to Riches Payables 3.1	120.
1617	Rags to Riches Receivables 3.1	120.
1622	Rags to Riches 3-Pak 3.1	289.
1612	Inventory Control 2.6	239.
1615	Professional Billing 2.9	239.
1616	Professional 3-Pak	359.
1618	Retail Business 3-Pak	359.
	Dac Software	
4502	Dac-Easy Light 1.0	. 44.
	Intuit	
2425	Quicken 1.01	. 33.
7	Layered 30 day MBG	
2613	Insight OneWrite 1.0	185.
2609	Insight Expert AP 2.02	459.
2610	Insight Expert AR 2.10	459.



LaCie ... 30 day MBG

Silverserver 1.11—Powerful server utility lets local and remote users share hard drives and modems. Also provides complete hard disk management, fast disk duplication and network chatter. \$89.

2611	Insight Expert GL 2.02 459.
2612	Insight Expert Inventory 2.0 459.
Sept Section 1	
2614	Insight Expert Time Billing 2.0 459.
	MECA 60 day MBG
2796	Managing Your Money 2.0 127.
	Monogram
2780	Dollars & Sense 4.1C 81.
2779	
LIIO	Nolo Press
0004	
2981	WillMaker 3.0
	North Edge Software
2986	Timeslips III 1.1
	Satori 30 day MBG
3322	Legal Billing 1.85
3323	Legal Billing II 2.56
	Composite OL 1.0
3978	Components GL 1.0
3324	
	SoftView
3473	TaxView Planner 2.0 64.
	MacInTax 1988 65.
	Survivor Software 30 day MBG
3289	MacMoney 3.02 62.
	MUMPERS & DATABASES

NUMBERS & DATABASES

*	Abacus Concepts 60 day ME	IG
4482	StatView SE + Graphics 1.03	229.
4481		349.
*	Access Technology 60 day N	
	Trapeze 2.1	
	Acius	
1010	4th Dimension 1.0.6	399.
	Ashton-Tate	
4098		249.
1322	dBASE Mac 1.0	295.
	Borland International	
1508	Reflex Plus 1.01	189.
*	BrainPower 60 day MBG	
1532	DataScan 1.0	
1535		
1534		
1537	StatView 512+ 1.2	175.
4066	The Analyzer Bundle (includes DataSc	
	DesignScope, and StatView 512+)	
	Bravo Technologies 30 day N	
	MacCalc 1.2D	. 77.
	Chang Labs 60 day MBG	
1611	C.A.T. 2.0 see special	229.

	Claris	
4196	FileMaker II 1.0	\$237.
1125		. 395.
*	Fox Software 30 day MBG	
4195	FoxBASE+/Mac 1.1	. 208.
4580	FoxBASE+/Runtime 1.1	
4844	FoxBASE+/Multi-User	. 319.
	Individual Software	
4720	101 Macros for Excel	37.
	Microsoft	
2866	File 2.0A	. 129.
2865	Excel 1.5	. 255.
	Nolo Press	
4228	For the Record 1.02	29.
	Odesta	
3014		
4211		
3013		. 339.
4	Paracomp 30 day MBG	
4664		. 159.
	Preferred Publishers	
4780	DAtabase 1.01	75.
7	ProVUE 60 day MBG	
4582	Panorama 1.0	. 209.
	Rubicon Publishing 60 day	
	Dinner At Eight-Encore Edition (C	P) 45.
	Satori 30 day MBG	100
	BulkMailer 3.22	
3321	BulkMailer Plus 3.22	. 195.
	Software Discoveries	111,520
3373	Record Holder Plus 3.0	45.
	GRAPHICS & DESIGN	
1	Altsys 30 day MBG	
4000		

1194 FONTastic Plus 2.01 54. Ashton-Tate 1323 FullPaint 1.0SE................ 68. Broderbund Software 4065 PosterMaker Plus 2.5B 36. 1432 VideoWorks II Accelerator 1.1 118. ★ Casady & Greene ... 60 day MBG 1575 Fluent Fonts 2.0 27.



MacConnection first...



Affinity Microsystems ... 60 day MBG Tempo Il—Powerful features to automate your work. Includes "smart" recording, conditional branching & repeats, pause until time or for user entry, play by name, Autopaste, transfers, real time recording, much more\$89.

1000	dine recording mout more 1,11,111, 4	
4835	Fluent Fonts/SC ITC Garamond Challenger Software	39.
1610	Mac3D 2.1	119.
1123	Claris MacPaint II 2.0	102.
1117	MacDraw II 1.0	319.
4815	Smart Form Designer	319.
4814		639.
4014	Cricket Software	000.
4346	Cricket Paint 1.0	99.
1667	Cricket Draw 1.1.1	169.
,,,,	Deneba Software 30 day MB0	3
1769	Canvas 2.0	
7	DreamMaker 60 day MBG	
4088	MacGallery (MacPaint format)	28.
4840	Cliptures: Business 1	95.
4841	Cliptures: Business 2	95.
	Dubl-Click Software	
3972	World-Class Fonts! Originals (1-2)	45.
3973	World-Class Fonts! The Stylish (3-4).	45.
3974	World-Class Fonts! The Giants (5-6).	45.
3964	WetPaint Classic Clip-Art (1-2)	45.
3965	WetPaint For Publishing (3-4)	45.
3966	WetPaint Animal Kingdom (5-6)	45.
3967	WetPaint Special Occasions (7-8)	45.
3968	WetPaint Printer's Helper (9-10)	45.
3969	WetPaint Industrial Revolution (11-12)	45.
3970	WetPaint Old Earth Almanac (13-14)	45.
3971	WetPaint Island Life (15-16)	45.
1015	Electronic Arts	0.10
4315	Studio/8 1.0	319.
	Enabling Technologies 30 day N	
1871	Pro3D	289.
1879	Enzan-Hoshigumi USA MacCalligraphy 2.0	00
2384	Foundation Publishing 60 day N	
2385	Comic Strip Factory 1.6	25
2000	Generic Software	20.
4319	Generic CADD Level 1 1.0.1	57
1010	CONTONIO OF LOVE 1 1.0.1	01.

*	Great Wave 30 day MBG
2272	Crystal Paint 1.0 \$27.
	Innovative Data Design
2417	MacDraft 1.2B
4707	Dreams 1.0 279.
	Linguist Software
2636	MacKanji 2.0 59.
2645	MacChinese Mandarin 79.
4777	Micro Illusions Photon Paint
	Miles Computing
4847	
1	Olduvai Software 60 day MBG
4667	Art Clips (formerly Post-Art) 51.
4850	Art Fonts 1
4851	Art Fonts 2
*	Paracomp 30 day MBG
4597	Swivel 3D 1.0
*	rSilicon Beach 60 day MBG
3504	Silicon Press 1.1 41.
3506	SuperPaint 2.0
3507	Super3D 1.0
3980	Digital Darkroom 1.0 157.
*	Solutions, Intl 60 day MBG
3446	The Curator 1.05 79.
	SuperMac Software 60 day MBG
3380	PixelPaint 2.0 199.
	Symmetry
4160	PictureBase 1.23-WetPaint Bundle 95.
	Synergy 30 day MBG
3129	KaleidaGraph 1.10 120.
	rT/Maker 30 day MBG
3633	Christian Images
	Zedcor 60 day MBG
3986	DeskPaint 2.01 69.
DI	DI IOLINO A PRESENTATIONS
PU	BLISHING & PRESENTATIONS
	44-1-0-4
	Adobe Systems

- 1212721021	Adobe Systems	-
1138	The Collector's Edition	79.



Zedcor ... 60 day MBG

4816 1142 4565	Patterns & Textures. \$149. Newsletters/Publishing Pack 1. 255. Forms and Schedules Pack 2. 309.
4566 1137	Presentations Pack 3
	MacConnection carries the entire Adobe Type Library (volumes 1-82). Listed below are Adobe's newest typefaces at press time.
4817	70 Century Expanded 95.
4818	71 Serifa 182.
4819	72 Caslon Open Face 63.
4820	73 Frutiger 245.

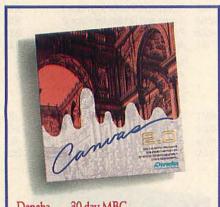


4821	74 Centennial	245.
4822	75 Stemple Garamond	125.
4823	76 Weiss	125.
4824	77 Garamond 3	125.
4825	78 Universal News Com/Greek	. 95.
4826	79 Avenir 1	182.
4827	80 Avenir 2	182.
4828	81 Bauhaus	125.
4829	82 Antique Olive	125.
	Aldus	
1330	Freehand 2.0	349.
4751	Persuasion 1.0	389.
1331	PageMaker 3.01	399.
	Altsys 30 day MBG	
	Fontographer 2.4.1 (CP)	239.
*	BrainPower 60 day MBG	
3960	ArchiText 1.03	179.
	Broderbund	
4465	DTP Advisor 1.0	. 47.
*	Casady & Greene 60 day MBG	
	MacConnection carries the entire	
	collection of Fluent Laser Fonts each	16
	Collection of Fideric Laser Furts each	7 40.
4839	Vivid Impressions	. 69.
4838	Quill Pack (Vol. 8 & 20)	



MacConnection

30 and 60 day Money



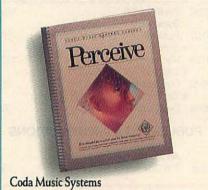
Deneba 30 day MBG
Canvas 2.0-Includes continuous Bezier curves,
auto tracing, high precision, 16.7 million colors,
hairlines, gray scales, layers, and more \$159.

Barretton.	The second secon
4836	Headline Pack (Vol. 10-12) 145.
4837	Modern Pack (Vol. 7, 14-18) 195.
4834	Distinctive Pack (Vol. 8, 19-22) 195.
4833	Classic Pack (Vol. 3-6, & 13) 195.
	Cricket Software
1668	Cricket Graph 1.3 119.
1670	Cricket Presents 2.0
	Letraset
2621	Ready, Set, Go! 4 4.5 275.
2619	Image Studio 1.5 275.
4709	LetraStudio 1.0 289.
	Microsoft
2878	PowerPoint 2.01
	Postcraft International
3157	Laser FX 1.6
7000	Quark
4621	QuarkStyle 1.0 199.
3230	Quark XPress 2.0 499.
	Springboard
3530	Certificate Maker 2.0 24.
4497	Top Honors
4500	Springboard Publisher 1.0 109.
-	SoftView
3981	FormSet Business Forms Edition 1.1 55.
00.15	3G Graphics
3942	Images with Impact!: Graph & Sym 1 59.
4583	Images with Impact!: Business 1 69.
	T/Maker 30 day MBG
3635	EPS Illustrations 75.

PROGRAMMING & HYPERMEDIA

	Borland International	
1511	Turbo Pascal 1.1	68.
*	Bright Star Tech 30 day MBG	
3962	HyperAnimator 1.5 (includes Stax, a	
	MacConnection exclusive!)	79.
	Broderbund Software	
1430	VideoWorks II HyperCard Driver 1.2	60.
	DreamMaker	
4115	MacGallery (HyperCard format)	28.
	Ideaform	
2418	HyperBook Maker 1.0	31.
	Individual Software	
4719	101 Scripts & Buttons for Hypercard	37.
	Manx Software	
4069	Aztec MPW C 3.6B	99.
4075	Aztec C + SDB 3.6B	99.

	Microsoft
4471	QuickBasic 1.0
1	OWL International 30 day MBG
3082	
	SmethersBarnes
1478	Prototyper 1.0
	Softworks, Inc.
4601	Stack Cleaner
4599	HyperTools #1 59.
4600	HyperTools #2 59.
*	Symantec 30 day MBG
4644	Just Enough Pascal 1.0 45.
3421	Lightspeed Pascal 2.0 65.
3420	Lightspeed C 3.01 95.
	TENpoint0
1338	
	Focal Point II 1.0 119.
1	TML Systems 30 day MBG
3549	
3548	
	True BASIC, Inc
	True BASIC 2.01 59.
	r Zedcor 60 day MBG
3985	ZBasic 5.0



Coda Music Systems

Perceive—You should hear what you've been missing! This musical ear training course combines listening, reading, and writing for effective learning with staying power. . . . \$52.

UTILITIES

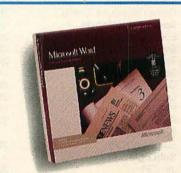
*	Affinity Microsystems 60 day M	BG
1014	Affinifile 1.1	16.
	Tempo II 1.0	
	Berkeley System 30 day MBG	
1541		52.
	Beyond, Inc.	
4203	MenuFonts 2.02	29.
	Borland International	
1510	Sidekick 2.0	68.
	Casady & Greene 60 day MBG	
	QuickDEX 1.4A	32.
	CE Software 60 day MBG	
1727	CalendarMaker 3.0	27.
1728		
4689		27.
1729	Control of the Contro	53.
	Dubl-Click Software	
1824	Calculator Construction Set 1.04 3	36.
1	Electronic Arts	
1843	Disk Tools Plus 1.01	31.
Terror and		Marine.

	r aranon computing	
4684	ScreenRecorder 1.0	135
*	Fifth Generation 60 day MBG	
4287	Pyrol 3.0 (screen saver)	. 15.
3954	PowerStation 2.5	32
	Cuitage II 1 0	45.
3955	Suitcase II 1.2	. 45.
3953	FastBack Mac 1.3 FWB Software 30 day MBG	. 54.
*	FWB Software 30 day MBG	
2232	Hard Disk Partition 2.0	. 41.
4683	Hard Disk DeadBolt 1.0	53.
2231	Hard Disk Util 2.03	53.
LLOI	HJC Software	
4803	Virex 1.2	69.
4803		09.
	Ideaform	-
2419	DiskQuick 2.10	27.
2420	MacLabeler Plus 3.0	42.
*	Kent Marsh Ltd 30 day MBG	
2591	The NightWatch 1.02	89.
2592	MacSafe 1.08C	89.
0000	Lundeen & Assoc 60 day ME	ou.
2683	WorksPlus Command 2.0	. 5/.
	MEDIAGENIC	
4591	Open It! 1.0	. 49.
*	Microlytics 60 day MBG	
2732	GOfer 1.0	44.
1,02	GOfer 1.0	
4848	INIT Dicker	. 31.
	INITPicker	. 31.
4210	Screen Gems 1.0	. 47.
2913	Redux 1.5	59.
*	Olduvai Software 60 day MB	G
3031	Icon-Itl 1.1	. 39.
	PCPC	
3175	HFS Backup 3.0	54.
0170	SoftView	. 04.
0.474	Madallanco	40
3471	MacInUse 2.0	. 42.
	Solutions, Intl 60 day MBG	
3448	SmartScrap & The Clipper 2.0	. 46.
3449	SuperGlue 1.05	. 52.
*	SuperMac Software 60 day N	IBG
3383	SuperSpool 5.0	. 54.
3382	SuperSpool 5.0	82.
	Multi Haar Cuparl apar Capal 2.0	
3378	Multi-User SuperLaserSpool 2.0	199.
3377	Diskfit 1.4.1	54.
3379	Network Diskfit 1.4.1	199.
3381	Sentinel 2.0	155.
*	Symantec 30 day MBG	
4728	MacSQZ! 1.05	. 49.
4729	S.U.M. 1.02	. 59.
4129		. 59.
	The second secon	



Back Guarantees.

	Symmetry
3318	HyperDA 1.1
	William & Macias
3783	myDiskLabeler w/Color 2.9I 31.
3784	myDiskLabeler w/LaserWriter 2.9Ll 34.
	Working Software
3788	Findswell 2.0
	WORD PROCESSING
*	Access Technology 60 day MBG
3959	MindWrite 2.0 95.
4109	MindWriteExpress 2.0 145.
	Aegis Development
1133	Word Tools 1.2 42.
	Ashton-Tate
1324	
Marriage .	Claris
1129	MacWrite 5.0 102.
Service and the service of	Deneba Software 30 day MBG
4700	BigThesaurus (1.4 million words) 54.
1767	Comment 2.0 54.
1768	Coach Professional 3.0A 105.
Participant of the last of the	



Microsoft

Word 4.0-The word processor you've been waiting for. Features complete WYSIWYG editing, enhanced tables support, two-way file compatibility & automatic repagination. \$255.

	Electronic Arts
1543	Thunder! 1.1
7	Lundeen & Assoc 60 day MBG
	WorksPlus Spell 2.0 46.
,	Microlytics 60 day MBG
2733	Word Finder 2.0
4870	Electronic WordFinder 220 79.
	Microsoft
2884	Works 2.0 189.
2882	Word 4.0
	Niles & Associates
4602	EndNote 1.1.1 82.
	Preferred Publishers
4781	Vantage 1.0 59.
	Sensible Software
4692	BookEnds 1.0
3375	Sensible Grammar 1.1D 54.



Personal Training Systems ... 60 day MBG Training Modules-The fastest, most efficient way to learn Macintosh software. Each package includes audio cassette, predefined disk files, and a command summary card. See our listing for modules and prices.

	Software Discoveries
3374	Merge Write 1.0 \$34.
	Symantec 30 day MBG
3422	More II 2.0
	Symmetry
4504	Acta Advantage 1.0 65.
	T/Maker 30 day MBG
3639	WriteNow 2.0 109.
	WordPerfect
3800	WordPerfect Mac 1.0.1 185.
	Working Software
3792	Spellswell 2.0G 45.
	Quick Letter 1.0 75.

MUSIC & EDUCATION

	rars nova ou day MbG	
1215	Practica Musica 2.1	75
*	Bogas Productions 60 day MI	BG
1461	Studio Session 2.0	49
4255	Super Studio Session 2.0	75
1458	Country Disk	15
1459	Heavy Metal Disk	15
4832	Sound Effects Disk	15
1460	String Quartet Disk	15
4831	Music Disk 4 Pack Special	39
1	Bright Star Tech 30 day MBG	
1402	Alphabet Blocks 3.01	32
3961	Talking Tiles 1.0	69
	Broderbund Software	
4314	Type! 1.0	20
1423	Jam Session 1.1 (CP)	30
1422	Geometry 1.0 (CP)	
4067	Calculus 1.0 (CP)	59
	Coda Music Systems	
4367	MacDrums 1.01 (CP)	32
4483	Perceive 1.0	52
	Davidson	
1734	Math Blaster! 1.0 (CP)	27

	Electronic Arts	
3941	SmoothTalker 2.0	\$33
3940	First Shapes	33
3936	KidTalk	
3939	MathTalk	33
3935	Speller Bee	33
4619	Mavis Beacon Typing 1.2B	35
1846	Deluxe Music Construction Set 2.0.	61
	Farallon Computing	
2199	MacRecorder 1.1	135
	Great Wave 30 day MBG	
2277	TimeMasters 1.0	
2276	KidsTime 1.2	26
2270	American Discovery 2.1	27
4334	NumberMaze 1.0	27
2273	ConcertWare+ 4.0	39
2271	ConcertWare+ MIDI 4.0	79
1000	Individual Software	
4209	Typing Instructor Encore	26
0070	Learning Company	00
2670	Reader Rabbit 2.0 (CP)	33
0740	Mindscape	40
2748	The Perfect Score: SAT 1.0	46
4858	Excellerate (intermediate level)	29
4852	PageTutor (beginner level)	39
4854	LearnWord (intermediate level)	39
	Simon & Schuster 60 day MB	C
3305	Typing Tutor IV 1.2	
0000	Spinnaker	00
2329		58
2020	Springboard	00
3531	All production of the control of the	28
	Atlas Explorer (CP)	28
*	Think Educational 60 day MB	G
3615	MacEdge II 1.0 (CP)	27
3616	Mind Over Mac 1.4 (CP)	27
*	Unicorn 30 day MBG	HI ILL
3751	Animal Kingdom (CP)	27
3752	Decimal Dungeon (CP)	27



MacInTax-A sophisticated income tax preparation program that allows you to organize, store, and print out tax information. Includes 74 IRS



A\$3bill

		Fraction Action (CP) \$27.		Microsoft	p-service and a service and a	-
		Mac Robots (CP) 27.	2868			7772
		Math Wizard (CP) 27.		Miles Computing	DATNIT	
2000	3754	Read-A-Rama (CP)	2764		PIXELPAINT	CEN
			2767		Consumo Company	POAT
		ENTERTAINMENT	2765	Fool's Errand (CP)		
				Mindscape		6000
		Access Software	4083	Balance of Power 1990 (CP) 30.		
	4655	World Class Leader Board Golf 28.	3987		W 12 3 W 100	
		Accolade	2743	Crossword Magic (CP)	000	
	1184	Hardball (CP) 23.	2745	Deja Vu (CP)	A A MARKET	100
	4484		4596		OK MECHETONICO	Hest
		Activision	2749	Shadowgate (CP) 30.	COLUM GRAPHICA TOR MACINTORNESS	POLI
	4475	Quarterstaff (CP)	2750	Trust & Betrayal: Legacy of Siboot (CP). 30.		
	4486		2751		C 14 C F CO I LUDG	6.24
		Zork Zero (CP)		New World Computing	SuperMac Software 60 day MBG	
		Addison-Wesley	4490	Might and Magic (CP)	Pixel Paint 2.0—New version includes PANT	ONE
	4407	The Hobbit 24.		PBI Software	colors, color separation and halftoning. Ma	asking
	4474	Fellowship of the Ring 24.	3110		tools, and special effects like smoothing, bl	
		Broderbund Software	0110	PCAI		
	4099		3144		ing and dithering make for a sophisticated	8-bit
	4111	Moebius (CP, adventure & arcade) . 24.	4320		paint program	\$199 .
		Where is Carmen San Diego? (CP) 27.	4321	Lunar Rescue (CP)		
				Road Racer (CP)	4073 Colour Billiards	25
		Ancient Art of War (CP) 27. Ancient Art of War at Sea (CP) 27.	4317	Hodu Hacel (CF)	4078 Game Pak (above 3 titles)	
	4540					/5.
	1544	Bullseye Ferrari Grand Prix (CP)	The second		Spectrum Holobyte	200
				The state of the s	4001 Solitaire Royale (for Mac II)	20.
		P51 Mustang Flight Simulator (CP) 32.		SUPER STUDIO	4175 Solitaire Royale (for Mac SE)	20.
	2260	Casady & Greene 60 day MBG		SUPERION.	3464 Tetris	20.
		Crystal Quest 2.2C (CP)		100	4472 Tetris (color version)	
		Crystal Quest w/Critter Editor 2.2C 42.	MILLY	医	3460 GATO	26.
		Discovery Software 30 day MBG	4	J. The state of th	3461 Orbitor	26.
9	4408	Arkanoid	100	PART PART OF THE P	3462 PT-109	
	1050	Electronic Arts			3459 Falcon 2.0	32.
		Reach for the Stars (CP) 26.			Spinnaker	00
		Chessmaster 2000 (CP)			2328 Sargon IV (CP)	29.
		Chuck Yeager Flight Simulator (CP) . 32.			SubLogic 4698 Jet (<i>CP</i>)	-00
•	4588	Life & Death (CP, surgery simulation). 32.		CONTRACTOR A PROPERTY	4698 Jet (CP)	32.
	2007	Epyx	Bog	as Productions 60 day MBG	HADDWADE	
		Sub Battle Simulator		er Studio Session-Awarded 1988 Macworld	HARDWARE	
1	4660	Sub Battle Simulator for Mac II 29.				
	0540	Infinity Software		der Poll Music Software of the Year. Eight	NETWORKS & COMMUNICAT	IONIC
	2518	GO (CP)	voic	e upgrade and 93 instrument files \$75.	NETWORKS & COMMUNICAT	IONS
	2519	Grand Slam Tennis (CP) 27.	Mus	ic Disks Special-Rock, Country, String, &	The Art and the second	
		Micro Sports		nd Effects. Price thru April 30, 1989 39.	★Abaton 30 day MBG	
	2787	MSFL Pro League Football 32.	Jou	nd Enects. Thee did riphi oo, 1707 09.	4589 InterFAX Modem	. 329.
		MicroProse			★CE Software 60 day MBG	
	4697	Pirates! (CP)		Primera Software	3963 QuickMail 1.05	. 159.
			3169	Smash Hit Racquetball II 22.	★CompuServe 60 day MBG	
			4404	Sierra On-Line	1671 Grolier's Online Encyclopedia	
		(a)	4161	Mother Goose (CP)	1676 CompuServe Information Service	
			3397		1673 CompuServe Navigator 2.02	45.
		1.2	3394	King's Quest I (CP) 29.	1674 Standard Service/Navigator Bund	de 59.
		12	3395	King's Quest II (CP)	★DataViz 60 day MBG	
		Waste Nove (6)	3396	King's Quest III (CP) 29.	1823 MacLink Plus 3.0	
		HAMILEANIA WI	3398	Police Quest (CP) 29.	4842 MacLink Plus/Translators	
			3399		★Dove Computer 60 day MB	
	100			Space Quest II (CP) 29.	FastNet networking products	call
	35%			Silicon Beach 60 day MBG	★Dow Jones 30 day MBG	-
	- 23	The state of the s	100000000000000000000000000000000000000	Apache Strike	1789 Dow Jones Membership Kit	
	101		3503		1785 Desktop Express 1.03	
		the same of the sa	3502		1786 Market Manager Plus 2.0	
	T/M	laker 30 day MBG		World Builder 41.	*Farallon Computing 60 day	
		Now 2.0—Blends simplicity with power		Simon & Schuster 60 day MBG	4208 Timbuktu 2.0.1 (no MBG)	
				Star Trek Kobayashi Alternative (CP) 24.	4866 Timbuktu Remote (no MBG)	
		performance. 2.0 has over 50 new features	3304	The state of the s	4867 Timbuktu 30-Pack (no MBG)	
	inclu	iding mail merge, a 100,000 word spelling	00.45	Sir-Tech	2201 TrafficWatch 1.08 (no MBG)	
		onary direct import and export of Text	3347	Mac Wizardry (CP)	2202 PhoneNET-AppleTalk 120 adapte	r 9.

4071 Mac • Man (w/adapter) 24. 4072 The Solitaire DA 24.

dictionary, direct import and export of Text,

MacWrite, & RTF (Word option) \$109.

2204 PhoneNET PLUS (DB-9)...... 35.

2205 PhoneNET Punch Down Block 69.



"You guys are what's wrong with America."

Dear MacConnection,

A couple of weeks ago I had the sudden urge for a new Datadesk keyboard for my Macintosh Plus. Twelve hours later, I walked into my office and the keyboard was on the receptionist's desk. Instant gratification. No time to hunger after a new goodie. No wait, no muss,

no fuss. This is *not* the spirit that built this fine country. Lincoln had to agonize through years of failure before he was elected President. Women had to wait 150 years for the right to vote. And here you are, indulging your customers' every whim in less than 24 hours. You guys are what's wrong with America.

You should be ashamed of yourselves.

Stephen Fleming Sterling, VA

MacConnection MacConnection

MacConnection, 14 Mill Street, Marlow, NH 03456 1-800/622-5472 603/446-7711 FAX 603/446-7791

©Copyright 1989 PC Connection, Inc. MacConnection is a division and trademark of PC Connection, Inc.

Just for the record, all the ads in this series feature real live MacConnection customers and the real live letters they wrote us. Really!

Overnight.

★FWB Software 30 day MBG 4263 PocketHammer40 \$999 4264 PocketHammer80 1499 4871 Hammer155 2899 4000 Hammer300 3999	. 2
## PCPC 3177 HD-WSI (Apple HD-20 to SCSI) 269 3181 MacBottom HD 21 SCSI 659 3180 MacBottom HD 32 SCSI 699 3185 MacBottom HD 32 SCSI 699 3184 MacBottom HD 32 W/Modem 829 3189 MacBottom HD 35 SCSI 859 3188 MacBottom HD 45 SCSI 859 3188 MacBottom HD 45 W/Modem 979 3190 MacBottom HD 70 SCSI 999 4658 MacBottom HD 70 SCSI 1249 3176 MacBottom HD 84 SCSI 1249 3176 MacBottom HD 144 Meg 1495	1. 2. 2. 4. 4. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2.
DISKS	2
3297 Sony 31/2" DS/DD Disks. 18 2214 Fuji 31/2" DS/DD Disks. 19 2792 MAXELL 31/2" DS/DD Disks. 19 3772 Verbatim 31/2" DS/DD Disks. 19	. 4
ACCESSORIES	
*Avery 60 day MBG 4864 31/2" Disk Labels (Qty. 250) 13 4865 31/2" x 15/16" Address Labels (Qty. 3750) 15 4811 81/2" x 11" Transparencies (Qty. 50) 22 **Computer Coverup 60 day MBG 1721 800K External Drive Cover 4 1723 ImageWriter II Cover 8 1720 Mac Plus Cover Set 10 1725 Mac SE Ext. Keyboard Cover Set 10 1725 Mac SE Ext. Keyboard Cover Set 10 4657 LaserWriter II Cover 10 **Ergotron 60 day MBG 2004 Mouse Cleaner 360° 15 3992 The Muzzle (covers power outlet) 62 1998 MacTilt (platinum) 68 2000 MacTilt SE 68 **MacTilt Large 85 **Goldstein & Blair 30 day MBG 2267 The Macintosh Bible (2nd Edition) 21	
★I/O Design 30 day MBG 2378 MacLuggage HDware	46
	46
	26 26 26
LYNX Computer 30 day MBG Turbo Trackball—The ultimate cursor control and pointing device. Works on any surface, and has "lock" button for single click drags	40 40 40 40 40 40

Quadlynx Turbo Trackball (Non ADB)

Turbo Trackball ADB

\$65.

2379 2376 2381	MacLuggage Imageware II\$45 MacLuggage Macinware Plus 64 MacLuggage Macinware SE 75 kKensington 30 day MBG
	MacConnection carries the entire line of Kensington's accessories. Partial listing below.
2577	Mouseway (mouse pad) 8
2569	Mac Plus or SE Cover
4126	LaserWriter II Cover
2589	Universal Printer Stand 15
2545	Universal Copy Stand 22
2556	Maccessories Anti-Glare Filter 33
2559	Apple Security System
2568	Maccessories SuperBase 34
2585	Printer Muffler 80 43
2586	Printer Muffler 80 Stand 24
2583	Printer Muffler 132
2584	Printer Muffler 132 Stand 24
4070	System Saver SE
2566	System Saver Mac (platinum) 64
2546	Maccessories A-B Box 64



full 2 Meg. Easily installed. Patented socket

technology allows better than Plus performance

without soldering \$499. 643 Mac II Stand and Cable Kit 65. 561 MasterPiece Mac II 105. ★MacConnection ... 60 day MBG 623 Solid Oak Disk Case, made by New England craftsman (holds 90 disks) . . . ★Mobius Tech. ... 60 day MBG 470 Fanny Mac QT 65. ★Moustrak ... 60 day MBG 694 Moustrak Pad (standard 7"x9") 8. Moustrak Pad (large 9"x11") 9. Moustrak Pad L/F (9"x11") 10. Moustrak Designer Series (Features selected photos from the book, "A Day in the Life of America.") Window Washer 1 12. 006 Thunderstorm 2............ 12. Old Cajun 3...... 12. 207 Vietnam Memorial 4...... 12. 009 010 3255 ImageWriter II Ribbon.....4. ImageWriter II 4-color Ribbon 9. 3261 3270 ImageWriter II Rainbow Six Pack. . . 20.

ImageWriter LQ Black Ribbon. . . . 17.



OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order.
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped 1st Class Mail, charged by weight.
- Upon receipt and approval, personal and company checks now clear the same day for immediate shipment of your order.
- COD max. \$1000. Cash or certified check.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices subject to change without notice.
- To order, call us anytime Monday through Friday 9:00 to 9:00 EST, or Saturday 9:00 to 5:30 EST. You can call our business offices at 603/446-7711 Monday through Friday 9:00 to 5:30 EST.

SHIPPING

Continental US: Barring massive computer failures and other natural or unnatural catastrophes, all non-C.O.D. orders phoned into MacConnection by 8 PM EST will ship Airborne the same night for next day delivery, except for those within UPS Ground Zone 1 (which is also an overnight service). The total freight charge on any order placed with MacConnection is now \$3. Backorders will also ship Airborne overnight at no additional charge. Some areas require an additional day delivery.

Hawaii, Alaska and Outside Continental US: Call 603/446-7711 for information.

and your order's filled.

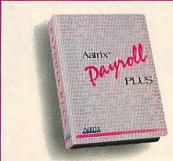
4869 PhoneNET Connector 10-Pack., \$225.
4868 PhoneNET Repeater 325.
2206 PhoneNET StarController 1199.
★Freesoft 60 day MBG
2219 Red Ryder 10.3 54.
Hayes
2300 Smartcom II 3.0B 88.
2307 Smartmodem 2400 449.
★Infosphere 30 day MBG
2513 LaserServe 2.0 62.
2514 MacServe 2.4
4595 Liaison 1.0A 185.
Insignia
4089 SoftPC 1.2 479.
★LaCie 30 day MBG
4335 SilverServer 1.11 89.
Microsoft
2875 Microsoft Mail 1.36 (1-4 users) 195.
2872 Microsoft Mail 1.36 (5-10 users) 325.
2873 Microsoft Mail 1.36 (11-20 users) 489.
2874 Microsoft Mail 1.36 (21-32 users) 639.
★Nuvotech 60 day MBG
3000 TurboNet ST (DIN-8) 30.
3001 TurboNet ST (DB-9)
3001 TurboNet ST (DB-9)
4503 MultiClip 36
4503 MultiClip
4503 MultiClip. 36. 3030 FontShare 1.1. 149. ★Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★Shiva 30 day MBG 4347 NetBridge 279.
4503 MultiClip. 36. 3030 FontShare 1.1 149. ★Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★Shiva 30 day MBG 4347 NetBridge 279. 3444 NetSerial X232 289.
4503 MultiClip. 36. 3030 FontShare 1.1 149. ★Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★Shiva 30 day MBG 4347 NetBridge 279. 3444 NetSerial X232 289.
4503 MultiClip. 36. 3030 FontShare 1.1 149. ★ Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★ Shiva 30 day MBG 4347 NetBridge. 279. 3444 NetSerial X232 289. 3443 NetModem V2400 479. ★ Software Ventures 30 day MBG
4503 MultiClip. 36. 3030 FontShare 1.1 149. ★ Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★ Shiva 30 day MBG 4347 NetBridge. 279. 3444 NetSerial X232 289. 3443 NetModem V2400 479. ★ Software Ventures 30 day MBG
4503 MultiClip. 36. 3030 FontShare 1.1 149. ★ Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★ Shiva 30 day MBG 4347 NetBridge. 279. 3444 NetSerial X232 289. 3443 NetModem V2400 479. ★ Software Ventures 30 day MBG 3454 Microphone 1.5. 119. 3455 Microphone II 2.0 225.
4503 MultiClip. 36. 3030 FontShare 1.1. 149. ★ Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★ Shiva 30 day MBG 4347 NetBridge. 279. 3444 NetSerial X232 289. 3443 NetModem V2400 479. ★ Software Ventures 30 day MBG 3454 Microphone 1.5. 119. 3455 Microphone II 2.0 225. ★ Solutions, Intl 60 day MBG
4503 MultiClip. 36. 3030 FontShare 1.1. 149. ★ Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★ Shiva 30 day MBG 4347 NetBridge 279. 3444 NetSerial X232 289. 3443 NetModem V2400 479. ★ Software Ventures 30 day MBG 3454 Microphone II 2.0 225. ★ Solutions, Intl. 60 day MBG 4308 BackFAX (regs. Apple FAX modem) 129.
4503 MultiClip. 36. 3030 FontShare 1.1. 149. ★ Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★ Shiva 30 day MBG 4347 NetBridge 279. 3444 NetSerial X232 289. 3443 NetModem V2400 479. ★ Software Ventures 30 day MBG 3454 Microphone 1.5. 119. 3455 Microphone II 2.0 225. ★ Solutions, Intl. 60 day MBG 4308 BackFAX (reqs. Apple FAX modem) 129. ★ Synergy 30 day MBG
4503 MultiClip. 36. 3030 FontShare 1.1. 149. ★ Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★ Shiva 30 day MBG 4347 NetBridge 279. 3444 NetSerial X232 289. 3443 NetModem V2400 479. ★ Software Ventures 30 day MBG 3454 Microphone 1.5. 119. 3455 Microphone II 2.0 225. ★ Solutions, Intl. 60 day MBG 4308 BackFAX (reqs. Apple FAX modem) 129. ★ Synergy 30 day MBG 3130 VersaTerm 3.20. 65.
4503 MultiClip. 36. 3030 FontShare 1.1. 149. ★ Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★ Shiva 30 day MBG 4347 NetBridge 279. 3444 NetSerial X232 289. 3443 NetModem V2400 479. ★ Software Ventures 30 day MBG 3454 Microphone 1.5. 119. 3455 Microphone II 2.0. 225. ★ Solutions, Intl. 60 day MBG 4308 BackFAX (reqs. Apple FAX modem) 129. ★ Synergy 30 day MBG 3130 VersaTerm 3.20. 65. 3131 VersaTerm-PRO 3.0. 195.
4503 MultiClip. 36. 3030 FontShare 1.1. 149. ★ Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★ Shiva 30 day MBG 4347 NetBridge 279. 3444 NetSerial X232 289. 3443 NetModem V2400 479. ★ Software Ventures 30 day MBG 3454 Microphone 1.5. 119. 3455 Microphone II 2.0. 225. ★ Solutions, Intl. 60 day MBG 4308 BackFAX (reqs. Apple FAX modem) 129. ★ Synergy 30 day MBG 3130 VersaTerm-PRO 3.0. 195. ★ TOPS 30 day MBG
4503 MultiClip. 36. 3030 FontShare 1.1 149. ★ Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★ Shiva 30 day MBG 4347 NetBridge 279. 3444 NetSerial X232 289. 3443 NetModem V2400 479. ★ Software Ventures 30 day MBG 3454 Microphone 1.5 119. 3455 Microphone II 2.0 225. ★ Solutions, Intl. 60 day MBG 4308 BackFAX (regs. Apple FAX modem) 129. ★ Synergy 30 day MBG 3130 VersaTerm 3.20 65. 3131 VersaTerm-PRO 3.0 195. ★ TOPS 30 day MBG 3723 TOPS Mac 2.1 149.
4503 MultiClip. 36. 3030 FontShare 1.1. 149. ★ Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★ Shiva 30 day MBG 4347 NetBridge. 279. 3444 NetSerial X232 289. 3443 NetModem V2400 479. ★ Software Ventures 30 day MBG 3454 Microphone 1.5. 119. 3455 Microphone II 2.0 225. ★ Solutions, Intl 60 day MBG 4308 BackFAX (reqs. Apple FAX modem) 129. ★ Synergy 30 day MBG 3130 VersaTerm 3.20. 65. 3131 VersaTerm-PRO 3.0. 195. ★ TOPS 30 day MBG 3723 TOPS Mac 2.1. 149. 3726 TOPS for DOS 2.1 119.
4503 MultiClip. 36. 3030 FontShare 1.1. 149. ★ Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★ Shiva 30 day MBG 4347 NetBridge. 279. 3444 NetSerial X232 289. 3443 NetModem V2400 479. ★ Software Ventures 30 day MBG 3454 Microphone 1.5. 119. 3455 Microphone II 2.0 225. ★ Solutions, Intl 60 day MBG 4308 BackFAX (reqs. Apple FAX modem) 129. ★ Synergy 30 day MBG 3130 VersaTerm 3.20. 65. 3131 VersaTerm-PRO 3.0. 195. ★ TOPS 30 day MBG 3723 TOPS Mac 2.1. 149. 3726 TOPS for DOS 2.1 119.
4503 MultiClip. 36. 3030 FontShare 1.1. 149. ★ Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★ Shiva 30 day MBG 4347 NetBridge. 279. 3444 NetSerial X232 289. 3443 NetModem V2400 479. ★ Software Ventures 30 day MBG 3454 Microphone 1.5. 119. 3455 Microphone II 2.0 225. ★ Solutions, Intl 60 day MBG 4308 BackFAX (reqs. Apple FAX modem) 129. ★ Synergy 30 day MBG 3130 VersaTerm 3.20. 65. 3131 VersaTerm-PRO 3.0. 195. ★ TOPS 30 day MBG 3723 TOPS Mac 2.1. 149. 3726 TOPS for DOS 2.1 119.
4503 MultiClip. 36. 3030 FontShare 1.1. 149. ★ Practical Peripherals 30 day MBG 3100 1200 Baud External Modem 79. 3102 2400 Baud External Modem 181. 3089 Mac Communications Pack 229. ★ Shiva 30 day MBG 4347 NetBridge. 279. 3444 NetSerial X232 289. 3443 NetModem V2400 479. ★ Software Ventures 30 day MBG 3454 Microphone 1.5. 119. 3455 Microphone II 2.0 225. ★ Solutions, Intl 60 day MBG 4308 BackFAX (reqs. Apple FAX modem) 129. ★ Synergy 30 day MBG 3130 VersaTerm 3.20. 65. 3131 VersaTerm-PRO 3.0 195. ★ TOPS 30 day MBG 3723 TOPS Mac 2.1. 149. 3724 NetPrint 2.0 119.

		Topicator.	
Micros	A Fik		Mich
	Janua T	Charles and	
	9	Section 1	1
310	HIE :	1	
nervi)	THE PERSON	BE	peo#
No. of the last of	ZOURCON.		No. of the last of
No. of Lot, Lot, Lot, Lot, Lot, Lot, Lot, Lot,	Name of the Party		

4714	InBox Starter Kit 2.2 \$19	9
4188	TOPS Teleconnector (DIN-8) 3	9
4189	TOPS Teleconnector (DB-9) 3	9
	TOPS FlashBox	
	TOPS Repeater 125	
3720	TOPS Flashcard 168	9.
	Traveling Software 60 day MBG	
3729	LAP-LINK Mac 2.0 8	4.

INPUT/OUTPUT

*	Abaton 30 day MBG
1188	ProPoint ADB 89
	Caere
4476	OmniPage 1.0 565
7	Cutting Edge 30 day MBG
3988	CE 105ADB Keyboard w/QuicKeys . 149
7	Datadesk 30 day MBG
1819	MAC-101 Keyboard (beige) 145
1820	MAC-101 Keyboard (platinum) 145
1821	MAC-101 Keyboard (ADB) 145
	Ex Machina 30 day MBG
4843	WristMac
	Marine Ma



Aatrix ... 30 day MBG

Payroll Plus—Handles from the simple to the complex: prints Form 1099, allows different hourly types, unlimited number of employees, and intergrates with other accounting and spreadsheet programs \$159.

*	Kensington 30 day MBG
2576	
2547	
	Koala Technologies
4845	
2593	MacVision 2.0 219.
-	Kraft Systems 60 day MBG
2600	3-Button QuickStick 39.
4082	
	Kurta
2604	IS ADB Tablet 255.
2605	Cordless 4 Button Cursor 65.
	LYNX Computer 30 day MBG
	Quadlynx Trackball (non ADB) 65.
	Turbo Trackball ADB 65.
	Mobius Tech 60 day MBG
	MultiScreen call
	MSC Technologies 30 day MBG
	A+ Mouse 65.
	A+ Mouse ADB 85.
	Nutmeg Systems 30 day MBG
	LCD Interface 399.
	15" Monitor for Mac Plus call
2994	15" Monitor for Mac SE special 999.

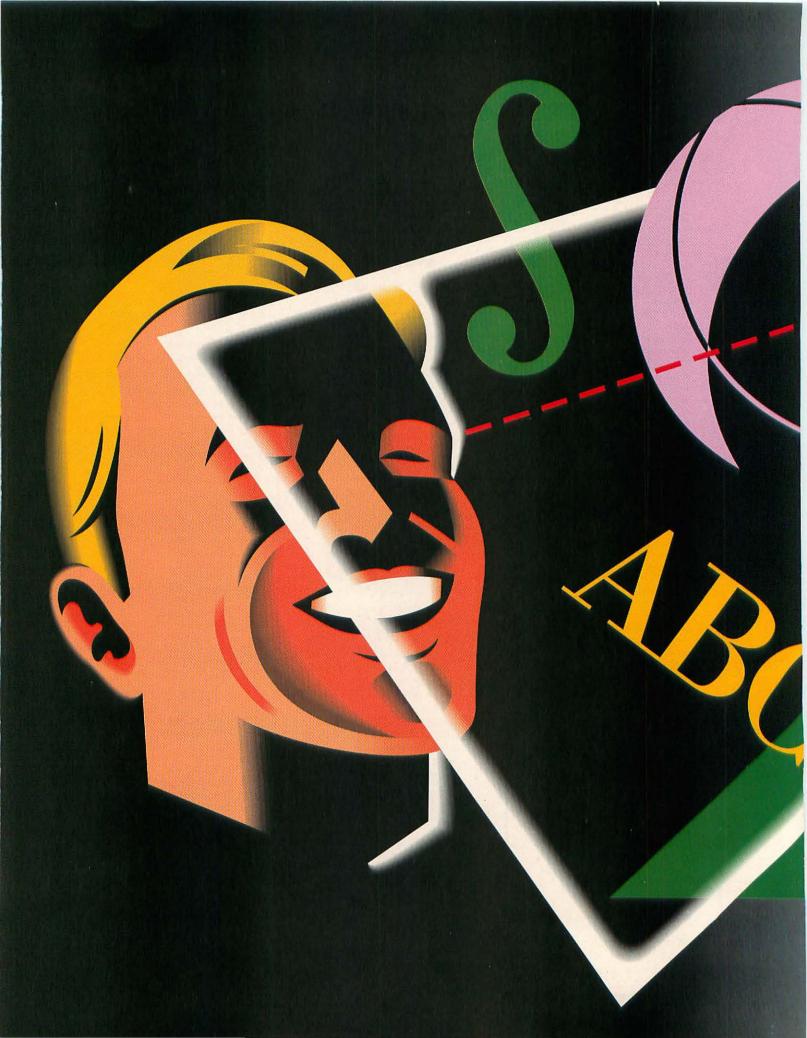


Practical Peripherals ... 30 day MBG
Mac Communications Pack—Includes external
2400SA Modem, cable, and top-selling communication software. Hayes compatible,
auto-answer. A superior value! \$229.

2993	15" Monitor for Mac II special 999.
4002	19" Monitor for Mac Plus 1349.
4096	19" Monitor for Mac SE 1349.
4097	19" Monitor for Mac II 1449.
	Olduvai Software
3035	Read-It!TS 1.06 79.
3034	Read-It! 2.0 199.
*	Orange Micro 30 day MBG
4488	Grappler Spooler
3036	Grappler C/Mac/GS 79.
4487	Grappler LS
4076	Grappler LQ 103.
	SoftStyle
3282	Printworks (Dot Matrix) 3.5 43.
3283	Printworks (HP laser) 3.5 85.
	Summagraphics
4298	BitPad Plus ADB
*	Thunderware 30 day MBG
3648	ThunderScan 5.0 with PowerPort . 189.
3646	MacPlus/SE Power Accessory 29.
3645	Mac II Power Accessory 42.

MEMORY & DRIVES

	WEWORT & DRIVES
1107	1 Meg SIMMs call AST Research
4666	Mac 86 439.
1229	Mac 286 1079.
*	Cutting Edge 30 day MBG
3989	800k Disk Drive (platinum) 175.
3990	The Wedge XL 30 + SCSI 579.
3991	The Wedge XL 45 + SCSI 729.
*	Dove Computer 60 day MBG
1801	SCSI Interface/Port 109.
1807	MacSnap 524E 289.
1809	MacSnap 524S 379.
1811	MacSnap 548 499.
1812	MacSnap 548S 589.
1800	MacSnap 2SE 439.
1797	MacSnap Plus 2 439.
1803	1024 Option 439.
	ACCELERATOR BOARDS
1793	MaraThon 020 MSE1 585.
1794	MaraThon 020 MSE2 (1 Meg) 979.
1795	MaraThon 020 MSE3 (math chip) . 779.
1796	MaraThon 020 MSE4 (1 Meg/chip). 1159.
4231	MaraThon 020 MSE4x4 2195.
4663	MaraThon 030 Accelerator 32 Mhz . 999.



Page-Layout Contenders

or Mac users thinking of taking the electronic publishing plunge, the hype, horror stories, and accolades heaped on each of the big three pagelayout programs—Aldus's PageMaker 3.01, Quark's QuarkXpress 2.0, and Letraset's ReadySetGo 4.5—are enough to send the poor souls scurrying back to their mat knives and waxers. This is a shame, because desktop publishing can more than repay the initial investment of time and money. But which page-layout program to buy?

In order to explore and rank the three programs' various features, I decided to use each one to create a mock newsletter for my hypothetical Forest Society (I worked up an annual report for this fictitious group in "The Great Write-Off," *Macworld,* November 1988). I chose a newsletter because it is a common desktop publication and because its attributes are shared by many other documents. The

Which is the champ —PageMaker, QuarkXpress, or ReadySetGo?

by Jim Heid

Forest Report requires several layouts and includes splashes of spot color. It also contains images created with a gray-scale scanner, and a fancy banner from Illustrator 88.

At first glance, it seems that any of the three programs could meet my needs. They all have similar features and operating styles, and each is a veteran of the desktop publishing world. Still, every contest has a winner and a loser. To determine my winner, I divided the competition into seven events, each of which tests different aspects of the programs. The event scorecards list program specifications and features for each category.

EVENT #1: **BASIC LAYOUT FEATURES**TESTS: Specifying publication length and characteristics; using layout tools and navigation aids.

All three programs mimic traditional page-layout techniques. Using on-screen rulers and T-square equivalents for precise positioning, you place text and graphics on a layout surface much as a pasteup artist would—but without the bother of rubber cement fumes and dull razor blades.

In each layout program, the first step involves specifying the page size and margins for the publication. All three let you change a document's margins at any time, but only PageMaker and ReadySetGo enable you to change the page size. To get a new page size with QuarkXpress, I had to create a new document and import the contents of the first document via the Clipboard.

To accommodate elements that repeat on each page (for example, page numbers, issue dates, rules), PageMaker and Ready-SetGo provide *master pages* that are like transparent overlays. For title pages and other unique pages, you can hide the master-page items.

Xpress's default page holds repeating elements, but it doesn't work like an overlay. Xpress copies the default items to each page of the document. On the plus side, you can easily change default elements, such as chapter headings, on individual pages. On the downside, to change repeating elements for the whole document—as I did when experimenting with different layouts—means enduring a convoluted (and obtusely documented) insert-and-delete-page routine.

Positioning and Navigating.

To place text or graphics with Ready-SetGo or Xpress, you first draw a *text box* or a *graphics box*—a container that holds text or images—and then choose the file you want to place. PageMaker doesn't require text or graphics boxes. You simply select the file containing the desired text or graphic, and the pointer changes shape to



Rulers and Guides

All three programs provide on-screen rulers and positioning aids, but PageMaker's are the most complete and flexible. Visible bere are vertical column guides and several horizontal ruler guides. PageMaker's page icons, used for accessing other pages, appear in the lower-left corner.

indicate that it's "loaded." You then click where you want the file to appear.

This point-and-click pasteup style is excellent for experimenting with different layouts, but the box-oriented style in Xpress and ReadySetGo is ideal for my newsletter, since each issue shares a similar layout. Creating a *template* that can handle subsequent issues requires a bit more setup time, but producing future issues is a cinch. I just pour the elements into each box and fine-tune as necessary. You can also create templates in PageMaker, but you must include dummy text and graphics to

difficult since you must release the mouse button and wait for the program to redraw the element before you can check its position. PageMaker shows the text or graphic element as you drag it.

PageMaker also excels at creating multicolumn pages and varying column widths from page to page. Xpress and ReadySetGo let you change the width of column guides at any time, but each change applies to every page in the document. (Although the guides change, existing text isn't reformatted.) In PageMaker, unless you create the column guides on the







Pictured here are three sample pages from the Forest Report newsletter.

act as placeholders for the document's components.

Xpress and ReadySetGo offer dialog boxes that let you specify a text's or graphic element's position to within 1/10,000 inchthat's more precision than a Linotronic, Compugraphic, or Varityper Imagesetter provides. For mouse-oriented layout, however, PageMaker leads. Although all three programs provide snap-to guides which act as magnets that attract elements dragged near them, the guides in Ready-SetGo and Xpress are not as versatile as the ones in PageMaker. PageMaker can display column guides and snap-to guides simultaneously (see "Rulers and Guides"). And with it, you can temporarily place items outside a page's boundaries, just as a pasteup artist might tack something to a layout table for later use.

When dragging text or graphic elements, Xpress and ReadySetGo show only a blank rectangular bounding box, which makes aligning and positioning items more master pages, column widths are independent for every page.

All three programs offer a variety of magnification scales. To speed screen displays in reduced scales, all three programs *greek* lines of text—display gray horizontal bars instead of tiny, illegible characters. All three also let you specify the type size below which text is to be greeked.

While PageMaker and ReadySetGo provide page icons for accessing specific pages in a publication, Xpress requires that you scroll through a document as you would with a word processor. PageMaker and ReadySetGo also have a *grabber* tool for scrolling a page in any direction; Xpress makes you alternate between the horizontal and vertical scroll bars. ReadySetGo's handy thumbnail window, new in version 4.5, shows reduced versions of numerous pages at once (see "Thumb(nail)s Up").

Event #1: Basic Layout Features

		PageMaker 3.01	QuarkXpress 2.0	ReadySetGo 4.5
	Maximum document length (in pages)	128	limited by memory	limited by memory
	Maximum number of open documents	1	limited by memory	limited by memory
	Supports custom page sizes	•	• 100	•
	Maximum page size (in inches)	17 by 22	48 by 48	99 by 99
-	Existing document's page size can be changed	•		•
	Master pages for repetitive elements			•
	Existing layout reflects changes to master page	•		•
	On-screen rulers	•		•
	Measuring systems supported ¹	A, C, D, E, F	A, B, C, D, E	A, B, C, D
	Snap-to-guides	•	•	
	Adjustable snap sensitivity			•
	Row-and-column layout grids			•
	Multiple column grids	•	• white	IV LO DE LA TRUM
	Independent column guides on each page	optional		
	Displays grids and guides simultaneously	•	•	automatical designation
	Guide positions can be locked	•		•
	Displays pointer position relative to zero		optional	
	Markers in rulers to indicate pointer position	•	not always ²	•
	Vertical ruler can use different measuring system	•		
	Type of tool palette	floating window	fixed palette	fixed palette
	Icons for accessing other pages	•		•
	Scroll bars for accessing other pages			
	Thumbnail window for accessing other pages			•
	Viewing scales (percentage of actual size)	50, 70, 100, 200, 400	50, 75, 100, 200	50, 75, 100, 200
	Adjustable text-greeking threshold	•	•	•
	Shows elements being dragged	•3		

¹A = picas; B = points; C = inches; D = metric; E = ciceros; F = tenths of an inch.

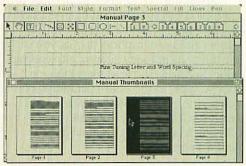
EVENT #2: **BASIC TEXT HANDLING** TESTS: Importing word processor files; flowing text across columns and pages; automating repetitive formatting.

All three programs let you type and edit text directly on a layout, and Ready-SetGo and QuarkXpress contain spelling checkers. (ReadySetGo's is better; Xpress's provides a useful word count but flags many plurals as misspelled.) ReadySetGo also offers a search-and-replace command and a glossary feature.

Despite these niceties, I still prefer to use a word processor for original drafts and for specifying font and type size. All three page-layout programs can import formatted documents from several Mac word processors; PageMaker also reads documents from the IBM PC version of PageMaker as well as from many other PC programs.

Alas, ReadySetGo has trouble importing Microsoft Word documents. Ready-SetGo doesn't filter out text formatted in Word's hidden-text style, and it ignores such rudimentary formatting information as hanging indents, tab leader characters, and paragraph spacing. Letraset says it's aware of some Word import problems and plans to fix them in a maintenance upgrade.

When importing a file with Page-Maker or ReadySetGo, you can specify that the program convert the Mac's typewriterstyle quotes into true opening and closing quotes, and convert double hyphens into em dashes. This is a must-have feature for improving a document's typographic quality. Xpress needs it.



Thumb(nail)s Up

Only ReadySetGo offers a thumbnail window, which shows reduced versions of numerous pages at once. These let you quickly move to any page, print thumbnail pages, change the order of pages, or copy an entire page to the Clipboard. ReadySetGo's page icons are visible at the top of the document window.

Linking and Formatting

To flow lengthy passages into discontiguous text boxes, *linking* features are required. With ReadySetGo and Xpress, you use a linking tool to specify the relationship between the text boxes you've drawn. The steps are nearly identical in both programs, but Xpress provides more feedback by drawing arrows between linked text boxes (see "Text Linking"). Xpress can also automatically generate page numbers for jump lines (for example, *continued on page 4*)—which is very useful in periodical publishing.

PageMaker creates and maintains links automatically as you place an article. While this approach requires less initial effort, it's not well suited to periodicals with repetitive formats. For example, the lead

² QuarkXpress displays moving ruler markers only when the mouse button is down.

³ If you begin dragging immediately after selection, only bounding box is shown.

feature in my newsletter always starts on page 1 and continues on page 4. With Xpress and ReadySetGo, I can create a template containing linked but empty text boxes on those pages. PageMaker, on the other hand, requires that templates contain dummy text to act as placeholders.

For specifying fonts, sizes, and styles, all three programs provide Font and Style menus or submenus, as well as dialog boxes for choosing all aspects of character formatting at once. Superscripts and subscripts are missing from ReadySetGo's type formats, but you can create them by using a smaller type size and then moving the characters above or below the baseline with the Shift Up or Shift Down commands.

Speaking of baselines, in all three programs you can specify leading in explicit, baseline-to-baseline terms (the way designers and typographers do), or you can use the current font's built-in autoleading value. In Xpress the leading values you choose apply to the entire paragraph containing the cursor. With PageMaker and ReadySetGo, however, you can specify different leading for individual lines within a paragraph.



This Russian version of Parker Brothers' game, Monopoly, was laid out using ReadySetGo.

EVENT #3: ADVANCED TEXT HANDLING

TESTS: Automatic page insertion and text flow; vertical and borizontal justification; kerning and tracking; hyphenation; creating special effects with type.

All three programs provide an autoflow feature that eliminates the need to turn pages in order to place leftover text. QuarkXpress and PageMaker automatically add new pages to the layout, flow the text into columns on those pages, and link the text to the previous page. With ReadySet-Go, you must first insert a number of pages and specify that they be linked. If the text doesn't fit, you must add more pages manually. PageMaker's autoflow feature fills every column on each page. Should your layout require that the continuations of a story appear in the second column of every page, for instance, you would have to use the more cumbersome semiautomatictext-flow mode.

Xpress wins the autoflow competition because it lets you specify exactly where you want text to appear on each page, by creating and linking text boxes on the default pages. ReadySetGo offers the same option, but doesn't insert pages automatically.

Justifying Your Actions

Traditional layouts generally employ vertical justification: columns align evenly across the top and bottom. Ready-SetGo can vertically justify columns by feathering—adding extra space between every line-or by adding extra space between paragraphs.

As for horizontal justification, only PageMaker and Xpress allow you to specify that extra space be added between words, letters, or both, as well as to set maximum values for interword and interletter spacing. ReadySetGo lacks such features, but its Letterspace and Word Spacing commands do let you manually tweak word and letter spacing for a selected range of text. Letraset says improved word- and letter-spacing control is planned for a future version.

Unfortunately, Xpress contains a bug that causes occasional spacing problems in narrow columns of pseudo-italic (slanted font characters) text. Quark plans to fix the bug in a future release. Until then, use true italic fonts to avoid the problem.

All three programs feature automatic hyphenation. Xpress and ReadySetGo combine grammatical hyphenation rules with exception dictionaries, which hold words that bend grammatical rules or are hyphenated differently depending on their meaning, for example, project (a noun) and pro•ject (a verb). PageMaker bases all hyphenation decisions on a 110,000-word dictionary, which you can supplement with exceptions. In theory, PageMaker's reliance on a dictionary should make its hyphenation more accurate.

Event #2: Basic Text Handling

	PageMaker 3.01	QuarkXpress 2.0	ReadySetGo 4.5
Word processor formats supported ¹	A, B, C, D, E, F	A, B, C, D, E	A, B, C, D, E
Reads word processor file as text-only	optional	Continuity (State)	
Interprets Word style sheets	•	•	
On-screen floating style-sheet window	optional		
Ignores Word hidden text	•	Harly • Harl	
Automatic continued on page references	SINCE EMPINE	optional	
Displays codes for invisible characters		optional	
Interprets typed style tags	•		•
Allows creation of new style sheets	•	•	•
Translates typographic quotes and em dashes	optional		optional
Glossary feature			• 11111
Built-in spelling checker		ESTA DO CENTRAL	
Dialog box for precise text positioning		•	•
Type styles supported ²	BF, I, U, O,	BF, I, U, O,	BF, I, U, O,
	S, SC, X, R	S, SC, SS, SB, X	S, C, EX, X
Maximum type size (in points)	127	500	327
Case-conversion commands ³	AC, SC	AC, SC, IC	AC, AL, S, IC
Keyboard shortcuts for editing and formatting			

¹A = text-only; B = Word 3.0; C = MacWrite; D = WriteNow; E = Microsoft Works; F = many IBM PC word processors.

² BF = bold; I = italic; U = underline; S = shadow; O = outline; C = condensed; EX = extended; X = overstrike; SS = superscript; SB = subscript; SC = derived small caps; R = reverse.

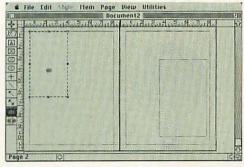
³ AC = all caps; SC = derived small caps; IC = initial caps; AL = all lowercase; S = sentence caps.

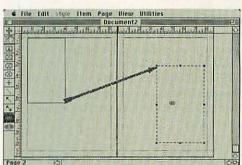
Kerning and Type Effects

Each program provides automatic and manual *kerning*—the ability to add or remove space between characters that don't sit well together, as in the pairs *To* and *Ye*. The automatic kerning in PageMaker and Xpress relies on the pair-kerning data built into most fonts. Because automatic kerning slows the program slightly and is of less value with small type sizes, PageMaker lets you specify an autokern threshold—a typesize below which PageMaker doesn't automatically kern.

ReadySetGo's automatic kerning is better described as semiautomatic. You must first select the text to be kerned, press the Option key, and choose Auto Kern. Failure to follow these steps for all similar text in a publication means inconsistent kerning, which is worse than no kerning at all.

To get that hand-set look with headlines, there's no substitute for manual kerning. I prefer the manual kerning features in ReadySetGo and Xpress to those in Page-Maker. Unlike PageMaker, both programs provide dialog boxes as well as keyboard shortcuts for specifying the precise amount of reduction.





Text Linking

In ReadySetGo and QuarkXpress, you use a linking tool to define the relationship between blocks of consecutive text. In Xpress, shown here, text boxes on two pages are being linked by clicking the linking tool in the first text box (top), then in the second box (bottom). Xpress draws an arrow to confirm that the boxes are linked.

Event #3: Advanced Text Handling

	PageMaker 3.01	QuarkXpress 2.0	ReadySetGo 4.5
Adds pages as needed for lengthy imports	optional	optional	
Autoflows text into selective columns		•	•
Automatic vertical column justification			optional
Automatic kerning	• 44	•	semiautomatic
Adjustable auto-kern threshold	•	•	•
Adjustable auto-kern scaling factor			•
Kerning precision (in ems)	0.042	0.005	0.001
Adjustable word spacing for justified text		•	•
Automatic hyphenation method	dictionary	grammatical rules	grammatical rules
Exception dictionary	•	•	•
Prompted hyphenation mode	•		The second
Hyphenates selected word or range of words	•		
Hyphenates capitalized words	•	optional	optional
Adjustable number of consecutive hyphenations		•	•
Adjustable word-length hyphenation threshold		•	•
Adjustable hyphenation zone	•		
Prevents hyphenation of last word in paragraph			optional
Word processor export formats supported ¹	A, B, D	A, B, C, D	A
Exports Word style sheets	•	•	
Exports style tags	optional		optional
Searches and replaces text			•
Searches and replaces font, size, and style		• 500	•
Text-stretching and condensing command		•	•
Text-rotation commands			
Text-shading commands		•	

¹ A = text-only; B = Word 3.0; C = MacWrite; D = WriteNow.

Xpress and ReadySetGo both claim to provide *tracking* features—fine-tuning the space between every character in a document—but they don't. On a typesetting machine, tracking increases the spacing between small characters slightly, leaves the spacing of most body-type sizes unchanged, and tightens up large type. Xpress and ReadySetGo don't work this way. They simply tighten or loosen spacing across a range of text. This can be useful, but it isn't tracking.

All in all, none of these programs make it particularly easy to produce attractive display type. It's a trial-and-error process of test prints and tweaking. If you work with display sizes extensively, consider Letraset's LetraStudio.

FreeHand and Illustrator don't make creating precisely kerned headlines any easier. LetraStudio, on the other hand, uses

its own top-quality screen fonts and lets you click and drag individual characters.

For creating special typographic effects, none of the three programs I tested can replace a specialized tool such as Letra-Studio, Illustrator, or FreeHand. Xpress, however, does let you shade text in 1 percent increments, condense text to as little as 25 percent of its original width, and expand it as much as 400 percent. ReadySet-Go's Expand and Condense commands alter the width of text, but you can't specify the percentage of alteration.

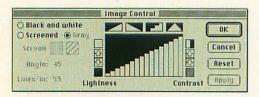
EVENT #4: **GRAPHICS HANDLING** TESTS: *Importing graphics; drawing boxes and rules; altering imported graphics.*

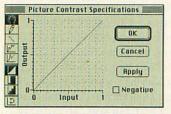
In my newsletter, the banner is an encapsulated PostScript (EPS) file created in Adobe Illustrator. The newsletter also includes some scanned images that I touched up using Letraset's ImageStudio, as well as some PostScript clip art from T/Maker's EPS Illustrations series.

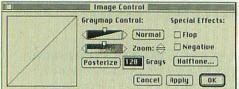
All three page-layout programs can accommodate the popular Mac graphics file formats, although PageMaker doesn't support ImageStudio's raster image file format (RIFF). ImageStudio files must be imported in tagged-image file format (TIFF), which is too bad, since TIFF files take up far more disk space. (For an introduction to gray-scale scanning and image formats, see "Getting Started with Scanners," *Macworld*, November 1988, and "A Halftone Handbook," *Macworld*, October 1988.)

To import graphics in ReadySetGo and QuarkXpress, you draw a graphics box to hold the image, and then choose the Get Picture command. In PageMaker, you choose Place, select the file, and click the loaded mouse pointer where you'd like the image to appear on the page. I prefer PageMaker's approach. Unlike text, a graphic on one page is never linked to a graphic on another, so there's no real benefit to drawing boxes that hold images.

Each of the three programs allows you to crop and resize imported graphics, although with ReadySetGo, you can't resize a graphic using the mouse. Instead, you type







Altering Gray Scales

All three programs let you alter the brightness and contrast of gray-scale images and specify custom halftone screens. The gray-scale editing windows are similar in each program: at the top is PageMaker's; in the middle is QuarkXpress's; and at the bottom, ReadySetGo's.

Event #4: Graphics Handling

	PageMaker	QuarkXpress	ReadySetGo
	3.01	2.0	4.5
Built-in drawing tools ¹	A, B, C, D, E	A, B, C, D, E, F	A, B, C, D, E
Line-width increments (in points)	.25, .5, 1, 2,	.25, 1, 2, 4,	.125, .25, .5, .75,
	4, 6, 8, 12	6, 8, 12	1, 2, 4, 6, 8
Custom line widths	No. of the last of	Manager Designation	
Dashed and double rules	•	•	• 100
Graphics file formats supported ²	G, I, J, K	G, H, I, J, K	G, H, I, J, K
Ease of placing graphics	veryeasy	very easy	easy
Fast gray-scale display option	100		•
Gray-scale modification features	•	•	•
Custom halftone screens	•	•	•
Ease of modifying gray scales	very easy	very easy	very easy, but slow
Ease of cropping graphics	veryeasy	easy	easy
Ease of sizing graphics	very easy	easy	difficult
Ease of creating rectangular text wraps	very easy	very easy	very easy
Ease of creating irregular text wraps	can be difficult	veryeasy	very easy
Dialog box for precise graphics positioning	1 1 1 1 1 1 1 1	•	•
Dialog box for precise graphics scaling	The State of the S		a luia i e same di
Allows graphics sizing and scaling with mouse	•	•	The make in red
Places graphics from Scrapbook file			

¹A = horizontal/vertical line (rule); B = diagonal rule; C = box; D = round-cornered box; E = circle; F = arrow.

² G = MacPaint; H = RIFF; I = TIFF; J = PICT; K = EPS.

values in the Specifications dialog box. I like being able to specify precise enlargement or reduction percentages (I wish PageMaker offered that option), but fast, click-and-drag resizing is also a must.

In my newsletter, I wanted a hairline-width frame to surround each scanned image. With PageMaker and ReadySetGo, you must draw such a box yourself using the programs' box-drawing tool. Positioning and sizing the box to surround the image exactly is difficult, even in a magnified view. With Xpress, you can simply choose the Frame command and specify the width of the frame's lines, and Xpress creates the box for you. And if you move the graphic, the frame moves with it. Xpress also includes a program that lets you create custom frames and borders.

Managing Scanned Images

I use scanned images often, so the speed with which a publishing program imports large image files is important to me. Of the three programs I looked at, Xpress imports scanned images the fastest. On a 2-megabyte Mac II, Xpress took 8 sec-



PageMaker Runaround

In QuarkXpress and ReadySetGo, wrapping text around an irregularly shaped graphic is a one-click job. In PageMaker (shown here), you must laboriously adjust the control points of a graphic boundary. This requires more effort, but you have far more control over the runaround's appearance.

onds to import a 406K TIFF file. PageMaker took 15 seconds, and ReadySetGo, a painfully slow 32 seconds. Worse, ReadySetGo interpreted the file's image-size information incorrectly. The original scanned image measured 2 by 2½ inches. When ReadySetGo imported it, its size doubled to 4 by 5 inches.

All three programs let you exploit the versatility of gray-scale images by altering their brightness and contrast, and specifying custom halftone screens (see "Altering Gray Scales"). The gray-map editing windows are similar in all three, but ReadySet-Go users will wait longer to use theirs. On a Mac II, Xpress and PageMaker redrew an altered image in about 1 second; Ready-SetGo took 11 seconds.

Because TIFF and RIFF files tend to be large, none of the layout programs actually save the image data in the document file itself. Instead, each program imports and displays a low-resolution version of the image, and then creates an internal link between the low-res version and the original

you locate it or ignore the problem. Choosing the latter option results in low-resolution results at printing time.

If Xpress doesn't find the image file in its original folder or in the folder containing the publication file itself, the program simply beeps and prints the low-resolution file. ReadySetGo helpfully searches every folder on the disk, but doesn't print a low-res version of the file. Thus, if the program doesn't find the original, you must import it—and probably resize and position it—all over again.

In all, PageMaker handles this thorny file-management issue best. I wish that it looked around before asking for help, but at least it asks.



The artwork for the Scrooged sound track cover was designed using PageMaker.

but it gives you far more control over the runaround than do Xpress and ReadySet-

Go. (Tip: To prevent PageMaker from reformatting text after every control point adjustment, hold down the space bar while adjusting the graphic boundary.)

EVENT #5: **COLOR CAPABILITIES**TESTS: Specifying spot color; importing color images; creating color separations.

Color adds a great deal to a publication—and to the printing bill. Products for scanning and reproducing color photos and images electronically are too new and too expensive to enable many desktop publishers to commit to more than a splash of spot color.

All three programs support spot color for text and graphic elements. Quark-Xpress and PageMaker let you specify color with any of three color models-redgreen-blue (RGB), hue-saturation-brightness (HSB), and cyan-magenta-vellowblack (CMYK). Xpress and ReadySetGo also let you specify colors using the industrystandard Pantone Matching System (PMS). although what you see on screen only approximates true PMS colors. Alas, Ready-SetGo does not support the CMYK support model, the most widely used model for process color separation. CMYK support is planned for a future release, according to Letraset. (For details on color models and color-separation issues, see "Selecting a Color Separator," Macworld, March 1989.)

Each program can also import color images created with Illustrator 88, al-

Event #5: Color Capabilities

	PageMaker 3.01	QuarkXpress 2.0	ReadySetGo 4.5
Supports spot color for graphic elements	•	•	•
Supports spot color for text		• 50	
Text style-sheets support color	•	•	•
On-screen floating color palette window	optional		
Color models supported ¹	HSB, RGB, CMYK	HSB, RGB, P, CMYK	HSB, RGB, P
Allows import/export of color palettes		•	•
Creates spot color overlays at printing time	•	•	•
Imports color TIFF files		•	•
Displays color TIFF files in color	n/a	•	•
Color separates TIFF files			
Imports color EPS files	•	•	•
Displays color EPS files in color			
Color separates EPS files	100	•	

¹ HSB = hue, saturation, brightness; RGB = red, green, blue; P = Pantone; CYMK = cyan, yellow, magenta, black.

image file. Only at printing time does the program use all the data in the original image file. Xpress uses this linked approach for EPS files, as well; and PageMaker uses linking with any graphic larger than 64K.

Linking has important ramifications that you must remember whenever you reorganize a hard disk, rename a file, or copy a publication to a different disk. When printing, each program begins looking for the appropriate RIFF or TIFF file in its original folder. If the image file isn't there, PageMaker presents a dialog box letting

A Wrap Session

On the first page of my newsletter the text wraps around a photo, and in the Calendar of Events section the text hugs the contours of some irregularly shaped graphics. With all three programs, creating rectangular text wraps, also called runarounds, is as easy as choosing a command and specifying how much space you want between the graphic and the text.

Irregular text wraps follow a similar process with ReadySetGo and Xpress, but in PageMaker, you move control points on a graphic boundary—a fence that PageMaker erects around an image to keep surrounding text at bay (see "PageMaker Runaround"). The process requires more work,

though none display the images in color. Xpress and ReadySetGo can import color bitmapped images saved in TIFF-24 or PICT2 formats. (PageMaker imports the latter, but not the former.) With Xpress's Image Control command, you can perform color correction on an imported image. But Xpress can't color-separate a bitmapped image at printing time, so that feature is of limited value. At present, bitmapped color separation remains the province of color graphics programs such as LaserPaint and Avalon's PhotoMac (see "Color Separation Explained," in the February 1989 issue).

EVENT #6: PRINTING

TESTS: PostScript and QuickDraw printer compatibility; printing oversized pages; printing documents to disk files.

When it comes to printing, PageMaker earns first place because of its custom Post-Script printer driver, which bypasses Apple's standard PostScript driver. The Aldus print driver uses Adobe Printer Description (APD) files, which contain specific information about the features (supported page sizes, fonts, number of paper trays, and so forth) of many popular PostScript printers. APD files also describe a printer's resolution and print engine, thus allowing Page-Maker to optimize the appearance of scanned images as well as shaded screens and rules. With the standard Apple Post-Script driver, hairline rules and shaded areas print lighter on a 300-dots-per-inch (dpi) printer than they do on a high-resolution imagesetter because the latter provides more dots per inch. APD files allow PageMaker to compensate for this problem.

In addition, the Aldus PostScript driver contains built-in smoothing routines that improve the appearance of bitmapped graphics by filling in their jagged edges. Apple's PostScript driver provides a smoothing option, but it works only with Apple's PostScript printers.

There are drawbacks to PageMaker's custom driver. It doesn't allow for background printing under MultiFinder and it isn't compatible with some print spoolers. Although PageMaker is compatible with Symantec's LaserSpeed, SuperMac's SuperLaserSpool, and Apple's LaserShare, if compatibility with a different spooler is important, you can specify that PageMaker use Apple's PostScript driver.

Event #6: Printing

	PageMaker 3.01	QuarkXpress 2.0	ReadySetGo 4.5
Uses custom PostScript driver	optional		
Prints document to disk as PostScript file	optional	1	1
Prints document to disk as EPS file	optional	and the large of the	
Prints registration marks	optional	optional	optional
Prints crop marks	optional	optional	optional
Prints color titles	optional	optional	optional
Selectively prints odd or even pages		•	
Prints reduced thumbnail pages	•		AUSIN OZ
Automatic tiling	• Solue	•	•
Manual tiling	•		
Bitmap smoothing on non-Apple printers	optional	optional	
Supports GCC Personal LaserPrinter		•	•
Supports Apple LaserWriter IISC	•	•	•
Creates halftones with non-PostScript printers	•	•2	PLP only
Supports background printing under MultiFinder	optional ³	•	•
Compatible with most print spoolers	•3	•	The state of the s

- 1 Mac-standard #6-F sequence works, but is undocumented and not as flexible as PageMaker's print-to-disk options.
- ² Versions 2.0a and later only
- 3 When used with Apple's PostScript driver only.

QuarkXpress doesn't use APD files or a PostScript driver, but it does provide direct support for several non-Apple Post-Script printers, including Linotronic imagesetters, Dataproducts' LZR-2665, QMS's ColorScript, Compugraphic's P400PS, and Varityper's VT600. As with PageMaker, choosing one of these printers causes Xpress to update the dialog box to reflect the printer's unique features. And like PageMaker, Xpress compensates for differences in output resolution when printing hairline rules and boxes. Xpress also contains its own bitmap smoothing routines.

ReadySetGo uses Apple's PostScript driver but provides no support for unique printer features, no compensation for different output resolutions, and no special smoothing routines.

Special Printing Features

All three programs provide automatic *tiling*, a feature that lets you print pages larger than a printer's maximum paper size. Automatic tiling breaks large pages into smaller overlapping tiles. Each program allows you to specify the amount of overlap.

To avoid creating a tile that cuts through a headline or graphic, Xpress and PageMaker let you manually control tile breaks. ReadySetGo, which supports the largest page size of the three, surprisingly lacks manual tiling.

Although many typesetting services prefer to work with original publication files, some accept *print files* created by intercepting PostScript code destined for a printer and saving it on disk. PageMaker's custom PostScript driver provides some sophisticated print-to-disk options that streamline the process of creating print files. You can specify that PageMaker include downloadable fonts in the print file, and you can create an EPS file of the document. I used the latter feature to reproduce the miniature of page 1 of my newsletter on page 2.

Xpress and ReadySetGo have no special print-to-disk features, but you can create a print file with them—and indeed, with any Mac application—by pressing **%**-F immediately after confirming the Print dialog box. The Xpress and ReadySetGo manuals don't mention this option.

EVENT #7: PROGRAM DESIGN AND DOCUMENTATION

TESTS: Quality of documentation; ease of learning; ease of use; reliability; hardware requirements; performance.

PageMaker's three volumes of documentation—a hands-on tutorial, a thorough user's guide, and a detailed reference manual—set the standard for page-layout programs. And all this is augmented by a unique, hypertext-style, online help system based on OWL International's Guide.

ReadySetGo's documentation, although clearly written and well-organized, lacks detail on topics such as the importing of files, printing to high-resolution imagesetters, and the use of service bureaus. Worse, one must jump between the 4.0 user's guide and the 4.5 update guide. And ReadySetGo has no online help.

Xpress finishes a distant third in the documentation derby. Its manuals are



The premiere issue of Smart magazine was laid out using QuarkXpress.

Event #7: Program Design and Documentation

	PageMaker 3.01	QuarkXpress 2.0	ReadySetGo 4.5
Quality of documentation	excellent	poor	verygood
Quality of online help	excellent	good	n/a
Ease of learning	very easy	easy	easy
Ease of use	easy	easy	easy
Keyboard shortcuts	fair	verygood	verygood
Reliability	excellent	verygood	verygood
Minimum disk space requirement	1.1MB	950K	727K
Maximum disk space requirement	3.3MB	1.3MB	727K
Suggested memory size in MultiFinder	700K	992K	1024K
Overall performance on Mac II	verygood	excellent	excellent
Overall performance on Mac SE	good	good	verygood
Online help	•		SUIT SECTION
Rating of documentation	excellent	fair	verygood

skimpy, poorly organized, and poorly indexed. The program offers detailed online help, but it's organized according to menu commands, not tasks.

All three programs are easy to learn, but PageMaker has the edge. By enabling you to place elements on the pasteboard or directly on the page, PageMaker is more faithful to the electronic layout-table metaphor. Also, more books and training materials are available for PageMaker than for the other two programs. ReadySetGo's ease of learning is hampered by the minimal feedback its text-linking tool provides. Xpress is limited by the program's unusual default page.

Once you've mastered the basics, which program is easiest to use? That's a tough call. PageMaker has the most complete scrolling and navigation aids but pro-

vides few keyboard shortcuts. ReadySetGo offers more keyboard shortcuts and has good scrolling and navigation aids, but its autoflow feature doesn't insert pages automatically; and ReadySetGo doesn't provide enough feedback when you're linking text boxes. Xpress offers excellent keyboard shortcuts and its text boxes are ideal building blocks for document templates, but scrolling and navigating are cumbersome.

As for reliability, all three programs behaved well for me, although each did crash at least once during testing. But Page-Maker gets the edge here because of the unique way it saves documents. Each time you move to a different page, PageMaker saves the page you just worked on. If a

crash occurs, you lose only the changes you made on the current page.

If there's a price to pay for Page-Maker's elegance, it's in performance. ReadySetGo's slow-motion graphics handling aside, PageMaker is generally the slowest of the trio, although not unacceptably so. ReadySetGo has the most responsive feel. Xpress is fast, too, but its limited scrolling and navigation aids make it feel much less so.

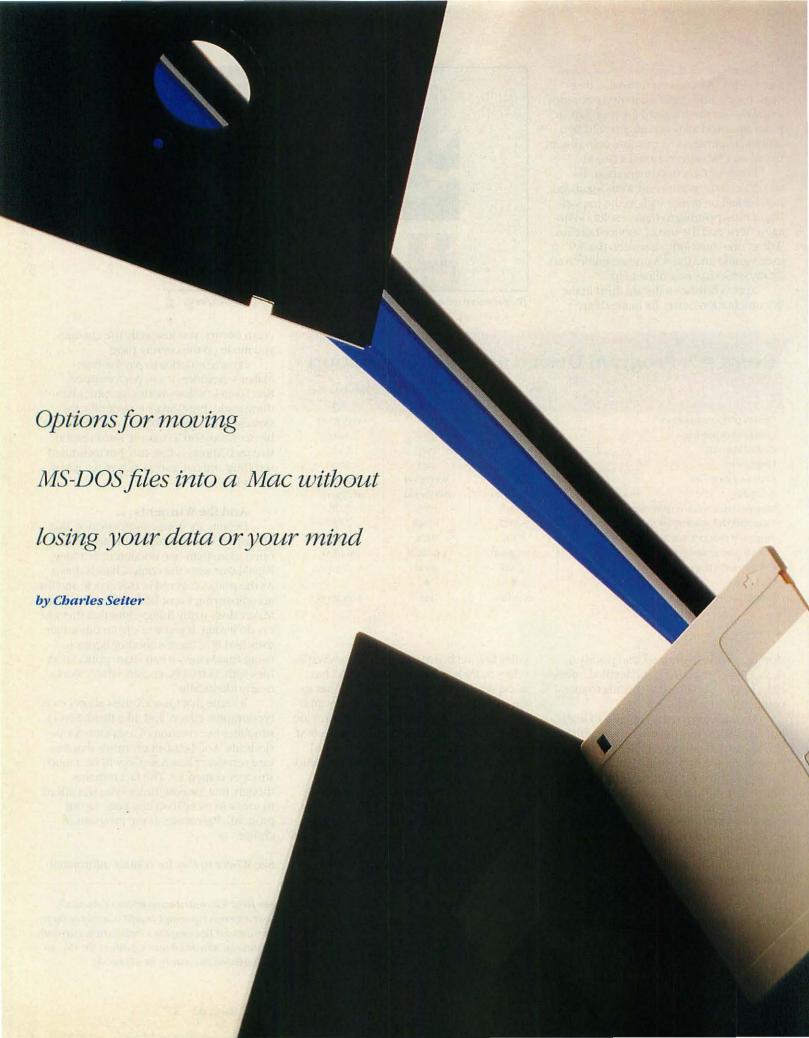
And the Winner Is . . .

Despite its slower performance, lack of support for RIFF files, and inability to open more than one document at a time, PageMaker wins the contest hands down. As the points covered in this article and the accompanying Event Tables illustrate, PageMaker does many things right that the others do wrong. If you work in an office that uses IBM PCs, there's another bonus to using PageMaker: it can share publication files with its IBM PC cousin, which works nearly identically.

It's true that QuarkXpress allows more typographic effects and, like ReadySetGo, simplifies the creation of templates for periodicals. And Letraset promises that a future version of ReadySetGo will be a much stronger contender. The fact remains, though, that for now, unless you can afford to invest in more than one page-layout program, PageMaker is the program of choice.

See Where to Buy for contact information.

Jim Heid is a contributing editor of Macworld and a former typographer and member of the International Typographer's Union. He is currently writing an advanced user's guide to the Mac, to be published this year by Brady Books.



A File-Transfer Primer

A friend has written a three-page résumé on an IBM PC. He would like to transfer it to your Mac so that you can print out several formatted copies on a LaserWriter.

You work for a company that has just bought Macintoshes. The company has five years of financial records in Lotus's 1-2-3 files on 5¹/₄-inch PC floppies, and you need to use this data in Excel.

Your office is setting up a local area network (LAN) to link Macintoshes and PCs. Which applications will work best together?

In all these cases, you need to accomplish a very specific task: getting files from MS-DOS applications into a format that Macintosh applications can use. And you want to perform these file transfers in the simplest and least expensive way. The good news is that transferring files from an IBM PC to a

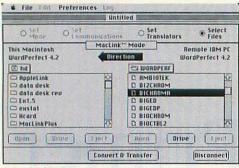
Mac is easy—much easier than transferring complex Mac files into the simpler, character-based world of the stock PC.

File Translation Programs

If you've never before used a communications program—to send files to another computer or to a bulletin board such as CompuServe—you should start your foray into file transfers with a file-transfer system that has had the communications hassles ironed out. My advice is simple: get a copy of MacLink Plus, LapLink Mac, or xFer. These specialized communications packages come with guaranteed-to-work cables, for hooking up the Mac to the PC, and disks containing the transfer application, one for the Mac and one for the PC.

For example, after you start up Data-Viz's MacLink Plus, the Mac displays a series of menus and dialog boxes (the PC program just responds passively). You tell the program which translators to invoke, click on the Connect button, and view the Mac files and PC files in two lists (see "Mac-Linking"). For example, you can set the

Charles Seiter is a chemistry professor turned computer writer and a Macworld contributing editor. He's written several books on programming languages and financial modeling.



MacLinking

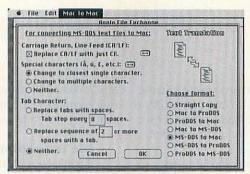
In MacLink Plus, you select the translators you need, and the program displays the appropriate files. This is particularly convenient if you are working with disks containing hundreds of files.

translators to look for .WK1 files on the PC or SYLK files on the Mac, so that you won't have to pick through all the files on a disk. You then select a file and begin transferring it from a PC format to a Mac-compatible format.

DataViz offers a comprehensive list of translators for database, spreadsheet, and word processing formats. The translators, now in their third version, are thoroughly debugged; any remaining translation problems occur because of application incompatibilities. For routine transfers—MS-

DOS WordStar or MultiMate to MacWrite or Word—the DataViz translators are completely reliable. MacLink Plus can transfer files at 57,600 baud (approximately 20K in 3 seconds) if the PC can keep up with it. That's no problem for an AT, but that transfer speed is usually too fast for an XT.

LapLink Mac, from Traveling Software, takes the transfer from the PC side—directories of Mac and PC files and a control menu appear on the PC screen, with only a Program Active notice on the Mac.



Apple File Exchange Conversion Options
Apple File Exchange works on a simple level,
leaving many details—such as file formatting—
to translator programs or translators built into
applications.

LapLink Mac offers 14 PC-to-PC file translators that cover all popular PC word-processing formats, but no PC-to-Mac translators. So a typical conversion sequence might involve converting a WordStar 3.3 file to Microsoft Word 4.0 (MS-DOS version), transferring the Word 4.0 file to the Mac with LapLink Mac, and then opening the file with Word 3.01 on the Mac. This, as you may guess from the description, is not as slick as a MacLink transfer. LapLink Mac, however, does let you transfer batches of files. (Just bear in mind that the program will cause you considerable head-scratching if you aren't familiar with PCs.)

A newcomer, xFer, from Messenger Software provides the simplest interface of all these programs on the Mac. When you switch from direct to modem connection, for example, the program automatically resets to an appropriate baud rate. Another feature that sets xFer apart is that, although it offers translators from WordStar and PC Write into Word and MacWrite, the program also allows Apple File Exchange (AFE) as a transfer option. This option creates an exact byte-for-byte file copy, and assumes that you will convert files from MS-DOS format to Mac format later using the AFE utility provided as part of the System tools (see "Apple File Exchange Conversion Options"). AFE puts the transferred file into Mac-readable format on a Mac disk, but the file must still be translated either by using stand-alone translators or by opening the file within an application. (Most new applications contain a range of translators.)

Finally, xFer allows you to use PC and Mac hard disks as backups for each other. And if you really want to learn what goes on during file transfer, xFer's documentation is the most informative.

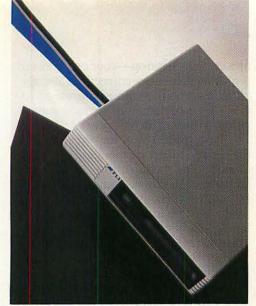
Basic Communications

If you have swapped files to a bulletin board or another computer, you'll have no problem using your favorite communications program to transfer files in binary format. The argument for communications programs over MacLink Plus, LapLink Mac, or xFer is based on cost and familiarity. If you are already an experienced Micro-Phone user, for example, there's no reason to buy and learn another program to accomplish simple binary file transfers. The dedicated programs are convenient, and they provide translators for special cases, but for the basics (text-to-text, SYLK-to-SYLK, Word-to-Word) they're not necessary.

AFE and AFP Explained

The need for the Apple File Exchange (AFE) utility arises from a simple fact: Mac files have more structure than PC files. A Mac file consists of two parts (the resource fork and the data fork) and includes a variety of information (the creation date, time of last use, file type, creator, and a 31-character name). A PC file has a date of last use, an 8-character name, and a 3-letter file extension. Thus the AFE must create some Mac ingredients for newly arrived PC files, and must organize the elements of Mac files headed the other way.

The AppleTalk Filing Protocol (AFP) exists so that network users can have instant access to both Mac and MS-DOS files. The protocol provides a network file type, transparent to the user, that lets each operating system (Mac and MS-DOS) identify files created on the other type of machine. As a standard, AFP is quite credible—not only is it the basis for AppleShare, but Novell, DEC, and 3Com also support it.



The Infinity 10 can read DOS disks or be used to back up a Mac.

You can transfer files by modem or you can direct-connect (your regular modem cable won't work—you'll need a null modem cable). Most PC and Mac communications programs offer the error-checking protocol Xmodem for binary file transfer, so this step will be glitch-free. The communications program asks you to name the file and then transfers the file, placing it on the desktop as a Mac file with a blank icon. If the communications program doesn't offer binary file transfer, you simply process the file through AFE.

STA SE	696846	11155523		SA SA	MPLE Words	tar allege		To the same of
0 · · · · · · · · · · · · · · · · · · ·			11DSample	Wordstor	File for Hin	duri teExpre	x ∈ Û	
the g	Lional	20111	text and	the "inte	thigence" of	a PC Honds t ment on the	you to convert or file into a nac inclus	
****	*****	idued,	converted and prin	the ori	ginal Wordsta any other Mac	r file can intosh Hord	be read, modifi Processing do	(ed, cil
trans and that's	rer c	There	ffffand	translate	it to the Ho	cintosh usi Hord to tak	ment on a PC, ng fiindAniteEx e advantage of es	
80y 4	eigh t	telligi	ence" the	th Honder	ordstar documenteExpress common at their tingurateExpressions.	n translate Mindunite	on Mil tell	es 'çB
g proce	essing		into into		te Iformal ma any Macintash		to 'import wo	rd tçü

Format Fun

This is what a transferred file looks like before it gets translated. The translator converts all the up-arrows, spaces, and hash marks to correct spacing and formatting information.

Once it's on the desktop, you can either open the file from an application that accepts that type of file, or you can process it with a translator that converts it from the file type of one application to the file type of another (for example, WordStar to

Word). You'll know if the document needs to be translated when you open it, since it will pop up with lots of strange, non-ASCII symbols (see "Format Fun").

The easiest transfers move files between Mac and PC versions of the same application. Microsoft Works on the Mac, for example, not only accepts word processing, database, and spreadsheet files from Microsoft Works on the PC, but both programs contain communications units that can automatically sign on to each other when the computers are connected. Although some features don't translate (Mac-Works 2.0 graphics don't have a counterpart yet in the PC product), Works transfers are no problem even for beginners.

Thus, if you save a PC file in a format that can be opened by your Mac application, you don't need a link package. Since most current versions of PC word processors support the DCA-RFT format, and Apple File Exchange proudly features a DCA-RFT-to-MacWrite translator, you should at least be able to call up the formatted file in any MacWrite-compatible word processor.

A Deluge of Data on Disk

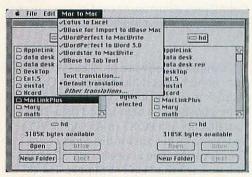
If you have lots of disk-based data to transfer to a Mac, however, you may not want to tie up a PC all the time as a data conduit. You may prefer to buy a dedicated drive that can read standard PC disks into a Mac. Currently, there are three widely avail able drives, two normal units and one high-density exotic. Apple's SuperDrive is also available for Mac II, Mac IIx, and Mac SE/30. Another file-transfer solution for this case is QuickShare, a dedicated transfer controller.

Apple continues its tradition of expensive but easy-to-use hardware, by offering the Apple PC 5.25 drive. The drive works with the Mac II or SE. It requires a controller board from Apple but derives its power from the Mac power supply. This drive is easy to install (which is lucky since the drive that shipped to me came without a manual).

The PC 5.25 reads and writes to 360K disks that have been formatted on a PC. You don't see the drive's icon on the desktop; you access files under the Apple File Exchange; the files appear in a directory beneath a tiny icon of a 5¼-inch disk (see "Translators in Apple File Exchange"). Also, if you are trying to use a Mac in an office full of IBM PC ATs, you should be warned

that these use higher-density 1.2-megabyte drives and typically will not write to 360K disks reliably. So unless your PCs are known to write to 360K disks reliably, the PC 5.25 isn't a solution.

Dayna's DaynaFile extends the Apple approach, being even easier to use and more expensive than the PC 5.25. In the Dayna scheme, the drive connects to the Mac's SCSI port. A drive icon appears on the screen with MS-DOS files arranged in Finder-style folders. Dayna also offers additional units to read 1.2MB PC AT 5¼-inch floppies, and both 720K and 1.44MB 3½-inch floppies. Since the DaynaFile doesn't

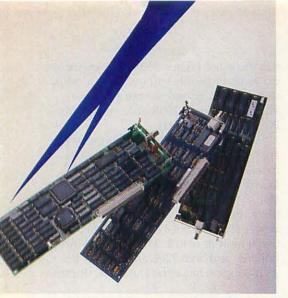


Translators in Apple File Exchange

Apple File Exchange allows you to add specific translators to the Mac-to-Mac menu. Once files bave been moved from a PC disk to a Mac disk, you need to perform a format translation.

need a separate interface card, it can be used with the Mac Plus as well as the SE and II. Dayna also sells translators from DataViz (it's the equivalent of having MacLink Plus built into the system), so that you can port fully translated files over to Mac applications.

The Infinity 10 from Peripheral Land is the exotic drive choice. In standard mode, the drive uses a specially formatted 5½-inch floppy disk to store 10MB of data and applications; its main application here is as a backup device for hard disks. Peripheral Land also supplies a utility that allows the drive to read both 360K and 1.2MB MS-DOS disks and perform a simple communications-style transfer. After transfer, you must process your MS-DOS files through an AFE/application combination or through the ubiquitous DataViz translators.



QuickShare's data transfer card gives you access to a PC's hard drive through the Mac SCSI port.

Another hardware product—the ultimate in high-speed file access—is Quick-Share from Compatible Systems. Quick-Share consists of a high-speed data-transfer card that fits in a PC XT or AT (not a PS/2) and special software for file conversion. The card gives you access to the PC's hard disk through the Mac's SCSI port. The PC disk appears with its own icon on the Mac's desktop.

QuickShare transferred a 285K file in less than two seconds. It's rated at 1.4 megabits per second, but in practical terms it can dump the contents of a 20MB hard disk into the Mac while you take a few sips of coffee. Put another way, you can transfer the whole hard disk in less time than it will take you to fix the margin settings in a transferred file. You can also partition the PC's hard disk to create a storage area for Mac files. Moving files from the PC partition to the Mac works like using a slightly poky extension of a Mac hard disk.

QuickShare's software, available separately as AnyText and AnyGraph, works with Apple File Exchange and takes a novel approach: besides standard options (a type of binary transfer and ASCII text), QuickShare has a conversion mode in which it captures the bitstream that would be sent to an IBM Graphics Printer. The data is translated into a formatted MacWrite document, or a MacPaint document in the case of graphics files.

This ingenious approach not only works, but it guarantees reliable file transfer from any word processor—if it prints, it will transfer—or from PC graphics program screen dumps. The translators make a variety of formatting guesses during the conversion, but on six test documents transferred into MacWrite (tabbed text from 1-2-3 and dBase, a simple WordPerfect file and a complex one, a WordStar file, and a Word file) the guesses were all correct.

QuickShare can be used with a PC that is part of a network, but it serves as a port into the network for only one Mac. But for an office in which one or two Macs are used as graphics machines or to produce financial reports from data files maintained on a PC, it's a cost-effective transfer solution and more convenient than the single-floppy drives.

Some day, all these considerations may be relics of the past. Apple's Super-Drive reads and writes both Mac and PC files on 3½-inch floppies. If file exchange and translation software were incorporated into System software, a Mac user with a SuperDrive could simply click open any type of PC file without worrying about file formats. Currently, the closest state to this blissful circumstance is life on a well-administered network.

Working with a Network

If your Mac already shares a network with PCs, you don't need to know about cables or add-on drives. You can already pull

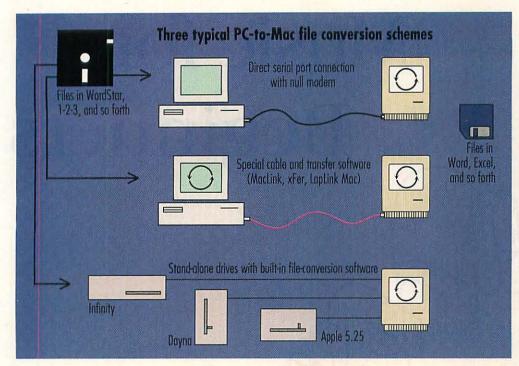
files onto the desktop—your only concern is making them work correctly in Mac applications. There are three basic ways to do this, presented here from the most authoritarian to the most democratic.

First, you can insist that everyone on the network use corresponding applications. This most often means accepting the embrace of Microsoft—thus the office uses PC and Mac versions of Word, Excel, or Works. Besides making file-transfer problems go away, this reduces training costs. The database champion is FoxBase; its PC and Mac versions are designed to work together on a network, and FoxBase is compatible with the PC's dBase standard. In some applications, specifically page layout, the matching-applications solution is the only one that will preserve your sanity. PC and Mac PageMaker files transfer back and forth effortlessly, graphics included; there is no other easy or obvious way to attain this harmony.

As a second option, you can insist that network users keep common-format versions of their files available for transfer. For word processing, this would mean saving documents in DCA-RFT format or as ASCII text. For spreadsheets, SYLK and DIF formats are available from nearly every application; you won't be able to transport macros between 1-2-3 and Excel, but you won't

Transfer Triumphs (and Failures)

When you transfer this type of PC file	To this type of Mac file	You keep	But you lose	
Excel 2.0 (converts as SYLK only)	Excel 1.5	values, most functions, custom dialog boxes, Mac-compatible macros	charts, some functions	
Multiplan SYLK	Multiplan SYLK	data, functions		
Works 1.01	Works 2.0	data files		
DCA/RTF	MacWrite	rulers, text format, Mac- compatible fonts		
WordPerfect 5.0 (saved as Word- Perfect 4.2)	WordPerfect 1.0.1	text format, headers, columns, footnotes	graphics	
Word 4.0	Word 3.01	text with styles	graphics	
PageMaker 3.0	PageMaker 3.0	text, TIFF, paint files	display of HPGL, draw, and EPS files (files will still print)	
dBase III	dBase Mac	data files	programs, reports	
dBase III	FoxBase+/Mac	data, programs, reports	Control of the last	
database tabbed	database tabbed text	data	relational structure,	
text			programs	



have to reenter data or formulas. For database files, plain old tab-delimited text is a reliable transfer format that's universally accepted; once more, your data will transfer even if programming elements won't.

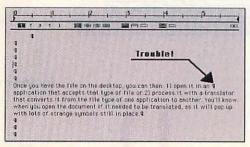
The third and most anarchic option is to equip the Mac side of the network with lots of file-translation capability and hope for the best. Some networks already imple ment this: TOPS, for example, uses DataViz's basic translator set. A few Mac applications stand out in their ability to handle file formats that others might overlook. Mind-Write 2.1, with the MindWrite Express option, can open and save nearly a dozen types of PC/Mac word processor file formats, and Wang and VAX files also, using special translators licensed from DataViz. An artwork utility called The Curator performs analogous tricks for transferred binary graphics files, accepting and translating PICT, TIFF, MacPaint, and encapsulated PostScript (both IBM and Mac).

File-Transfer Problems

Transferring spreadsheet and database data is usually straightforward. Even graphics transfer is straightforward in a perverse sort of way; either it's automatic, using a product such as AnyGraph or The Curator, or you can't do it at all. The problem child in the transfer family is word processing.

Some word processing formatting won't transfer exactly. Margins in many PC word processors are set by character count since the word processors are character based. When the translated data is opened in a proportional Mac font, the appearance changes. One trick is to save the document to Microsoft Word format in the PC application before transfer. Since Word sets the PC document margins in inches, the results are often better after translation. Likewise, you may find that you have better luck saving a document to DCA-RFT format within the PC application and then translating the transferred file to MacWrite with the translator built into Apple File Exchange, rather than counting on a perfect native-to-native translation. If a long document looks so scrambled at the Mac end that you'd spend hours touching up its appearance, it's worth looking it over once in a monospaced font like Monaco to determine whether all your problems arise from spacing translation or whether there was something untranslatable in the original document.

One frequent glitch that you can fix before transferring a file results from hidden characters. In the sample text "Hidden Gotchas," a bit of cutting and pasting has left a paragraph symbol at the end of the first line. In a long, much-edited document you can inadvertently accumulate an amazing number of these. When you view this piece of document in the usual way with special symbols hidden, all appears well. When you attempt to transfer this paragraph, there will be an unwanted paragraph break after the first line. Although this case isn't severe, it is an illustration of a general rule: if you can, look over PC documents with nonprinting characters displayed, before transfer. You may find, besides an assortment of unwanted paragraph symbols, other mystery characters that can result in whole paragraphs being translated into single lines with margins set three feet to the right. As a rule, unfamiliar nonprinting characters present file translators with a problem they can't solve, since the translator has to assume anything it comes across is intentional, rather than a bit of formatting left behind by a cut.



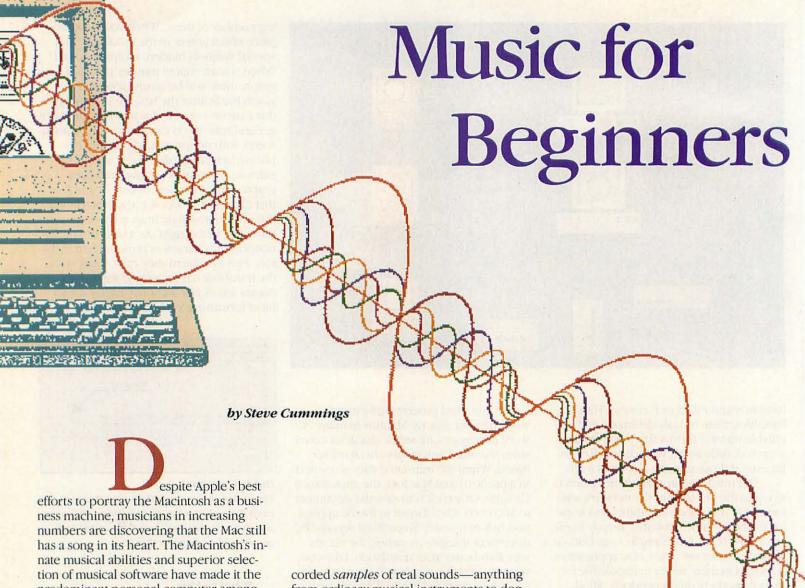
Hidden Gotchas

This screen shows one of the most typical kinds of glitch that defeat translator programs. When this text converts, there will be an unwanted paragraph break at the point shown.

What to Use

Most PC-to-Mac transfers are easy enough that you can puzzle them out using only Apple File Exchange and a communications program. If you will be doing a variety of transfers, you might want to throw a modest amount of money at the problem to automate it with dedicated software. If you will need to transfer large quantities of disk-based files, special-purpose drives for transfers are worth considering. Finally, if your Mac is linked to PCs on a network, a little time spent in setting file-transfer standards and inspecting word processing documents for hidden characters pays off handsomely.

See Where to Buy for contact information.



espite Apple's best efforts to portray the Macintosh as a business machine, musicians in increasing numbers are discovering that the Mac still has a song in its heart. The Macintosh's innate musical abilities and superior selection of musical software have made it the predominant personal computer among music professionals today. But you don't have to be a Hollywood producer with a roomful of equipment to make beautiful music with your Macintosh. Invest in a few reasonably priced programs and perhaps a MIDI synthesizer, and you can get started using the Mac for computer-assisted composition, notation, performance, and recording. If you're new to music, the Mac can also function as an excellent tutor.

Hardware

Just as it comes from the box, the Macintosh can generate *polyphonic* (more than one note at a time), *multitimbral* (more than one tone quality, or timbre, at a time) sounds. Four voices is the most the Mac can produce without a synthesizer, but some programs can trick you into hearing six. The sounds the Mac uses can be synthetically created waveforms or digitally re-

from ordinary musical instruments to dog barks. With these capabilities at your fingertips, you can faithfully approximate a jazz quartet, a rock combo, or a small chamber group.

When heard through its tiny built-in speaker, the Mac's sound can hardly be called robust and will win no awards for clarity. But hooked up to a stereo or other decent sound system, the Mac sounds surprisingly full-bodied (see "Get Amped"). When you outgrow the sound capabilites of an unaided Mac, a synthesizer or other electronic instrument can help the Mac deliver more notes, more timbres, and better sound quality. The Mac controls synthesizers through the magic of the Musical Instrument Digital Interface, or MIDI—the universal standard for communications between electronic instruments.

For a first MIDI setup, choose a multitimbral synthesizer; several reasonably priced models are available. In addition to synthesizers, a MIDI'd Mac can control stand-alone digital *samplers* (digital recording machines that record and play back sampled sounds polyphonically in high fidelity), drum machines, sound effects devices, mixers, and even lighting equipment. "Make Mine MIDI" diagrams two MIDI systems.

Sequencers

Ever since guitarist Les Paul pioneered multitrack overdubbing in the fifties, musicians have been exploiting technologies that let them build richly arranged recordings from individual parts played one at a time. Magnetic tape serves the purpose fairly well, but its sound quality deteriorates rapidly with repeated overdubs, and editing is difficult. A Mac and a good se-



quencer is a better alternative for electronic instruments. (You'll still need a tape deck to record vocals and acoustic and electric instruments.)

Sequencers have some elements in common with both tape recorders and oldfashioned player pianos. Like a tape machine, a sequencer lets you capture music on separate tracks. You record by playing on a MIDI keyboard connected to the Mac or by using the mouse to construct passages too difficult for your keyboard skills. Like a player piano roll, however, sequences aren't recordings of the sound of the music itself; they're series of detailed instructions that tell a synthesizer how to recreate the music. When you enter a tune from the keyboard, the sequencer stores more than just the notes; it can store all kinds of expressive nuances, including information about timbre, volume changes, pitch bend, and vibrato, as well.

But a sequence has one big advantage over a piano roll or a tape recording—you can edit it to your heart's content. A typical sequencer program includes options that enable you to move notes via cut-copypaste commands, transpose with a click of the mouse, make tempo changes without changing pitch (try that on a tape recorder), *loop* tracks so they play repeatedly, or *quantize* your music to correct rhythmic mistakes. Once the sequence is in its final form, you can use it in live performances or play it back for conventional recording.

The market for Mac MIDI sequencers is crowded and competitive, and quality is high, so singling out the best program for your needs can be difficult. If you're just getting started with MIDI, SouthWorth's inexpensive and uncomplicated One-Step will keep you plenty busy while you learn the ropes. Alternatively, you may want to bag as much MIDI firepower from the start

as your budget can accommodate. Desirable high-end features include separate looping settings for individual tracks, and variable tempo and time signatures. Ideally, the sequencer you select should read and write MIDI Files, a new file format for MIDI data exchange.

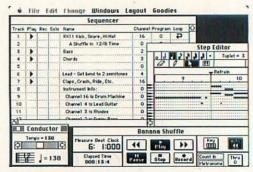
The two most popular MIDI sequencers, Mark of the Unicorn's Performer and Passport Designs' Master Tracks Pro, both offer a wealth of features for broadbrush editing and for razor-sharp control over individual musical events. Performer probably has the edge in sheer number of features; on the other hand, Master Tracks' graphical approach to editing MIDI data is easier to learn (see "Master Tracks Pro").

The current offering from Opcode, Sequencer 2.6, doesn't let you edit individual events. The program does boast a unique set of sequence-control features, however, including the ability to trigger sequences within other sequences, and to start sequences from your MIDI keyboard during performances.

Since today's drum machines are MIDI instruments, they can be controlled by the same sequencer you'd use to drive a synthesizer. Nevertheless, two or three companies have come up with special sequencer-like programs optimized for electronic rhythm instruments.

Intelligent Music's UpBeat can control any MIDI drum machine, and using its simple screen grid you can place conga slaps or cymbal crashes easily and precisely on any subdivision of the basic beat (see "UpBeat"). Like Intelligent Music's other products, UpBeat can be set to add a degree of controlled randomness, making the rhythms sound less mechanical.

Primera's Different Drummer works much like UpBeat, though it lacks randomizing features. On the other hand, you don't need a drum machine to play your



Master Tracks Pro

Passport Designs' hot-selling sequencer lets you edit MIDI data graphically as well as numerically.



Feature 6.1 Music for Beginners Upbeat #

UpBeat

The UpBeat grid for creating drum machine patterns.

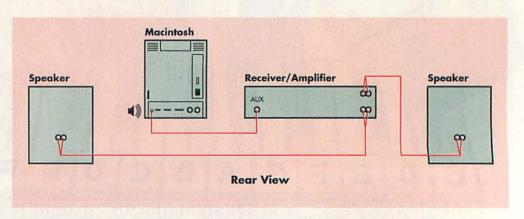
rhythm tracks. In addition to being able to output through MIDI devices, Different Drummer can play sampled sounds through the Mac. The program comes with a ready-to-use library of 30 percussion instruments.

Mac as Axe

If you want to make music but you've never learned to play an instrument, maybe you should try playing the Mac instead. Several programs turn the computer into an intelligent instrument that collaborates

Get Amped

To book up a Mac to a bome stereo system, you need a cable with a modular phone plug on one end for the Mac's speaker port, and a standard RCA plug on the other for the Aux jack on the receiver or amplifier. Switch the stereo to the mono setting to hear music out of both speakers. The Mac's output is actually bot enough to drive small speakers at reasonable volume, so you can book up directly to the speakers if you prefer. You can also plug beadphones into the Mac's speaker port, but you'll need a mono-to-stereo adapter to bear music from both earpieces.



Make Mine MIDI

When you're ready for a MIDI'd music system, connect a MIDI interface to your computer's modem and/or printer ports. Opcode and Passport Designs both make MIDI interfaces to suit a range of systems and budgets, and even Apple sells an inexpensive model. Then run MIDI cables from the interface to all of your instruments.

Although you can connect the MIDI Thru port of one instrument to the In port of the next (as in Figure 1), it's best to use an interface with multiple Out ports, or a MIDI *splitter* box, so that each instrument is connected as directly as possible to the Mac (as in Figure 2).

Macintosh

-00

Master MIDI Keyboard

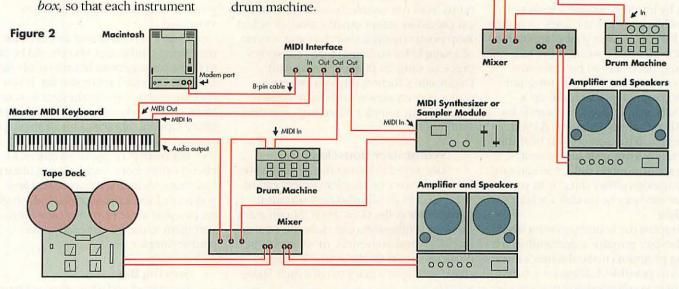
Figure 1

MIDI Interface

Synthesizer or Sampler

00

For multitimbral sound at a reasonable price, the \$199 Casio NT-240, with pint-size keys, or the \$349 CT-640, with full-size keys and more sounds, make excellent choices. If you're willing to use a synthesizer with no keyboard, check out the Yamaha FB-01 (\$375) or the Kawai K1M (\$549). In addition to a wide range of instrument sounds, the K1M comes with a slew of sampled drum sounds, so it can double as a drum machine.



with you in making music. You decide which sounds to use and when to change musical direction, while the program chooses most or all of the notes.

For example, whether your tastes run to classical or heavy metal, you can improvise for hours with Brøderbund's Jam Session and never play a sour note. While you solo on the Mac keyboard, one of Jam Session's animated bands performs on screen and backs you up (see "Jam Session"). Every key you play on the Mac produces a predefined, satisfyingly authentic riff tailored to the song you've selected. If you know standard musical notation, you can substitute your own patterns for the stock riffs.

Jam Session relies entirely on the Mac's built-in sound-generating talents. But since it uses sampled instruments, it sounds pretty good—the flutes sound realistically breathy, and metal power chords have a genuine crunch.

If you're ready to stray a bit from the path of recognizable genres, try Opcode's Music Mouse. As you move the mouse pointer across a grid on the screen to select notes, Music Mouse harmonizes your melody in one of five scales and outputs to the Mac or as MIDI. The resulting goulash won't be tightly structured or very complex; to your ears it may sound oddly beautiful, or unbearably bland.

Marry a little artificial intelligence to the recording and editing capabilities of a sequencer under a full moon at midnight and you might come up with a trio of even farther-out programs: two programs from Intelligent Music—Jam Factory and M— and the new Mac version of Dr. T's Keyboard Controlled Sequencer Level II (KCS). Carrying the intelligent instrument idea much, much further than Music Mouse, these programs take the notes you enter and play them back in a myriad of partially random permutations, all according to guidelines you define and within limits you set.

If you like living dangerously, these programs should be your cup of Long Island iced tea, for you're always tottering on the brink of total cacophony. By choosing the randomization limits carefully, however, you can achieve delightfully quirky, but still more or less toe-tappable, musical results. Check out the tapes recorded by Intelligent Music's own staffers for proof.

Jam Factory and M enable you to record your sessions and play them back, but for substantial editing you have to export work to a more conventional sequencer. You won't need to export KCS creations, since the program has a full complement of sequencer features. KCS is a hacker's dream; be prepared to look at screens full of tiny numbers. The program does offer some unique features, however.

The Sounds of Music

In the sixties, synthesizer pioneers laboriously crafted new sounds for their instruments by interconnecting a welter of mysterious black boxes via cables, or patch cords. Today you can use your computer to create patch files that contain the synthesizer settings necessary to produce any sound you want. Sound editing programs display the parameters that make up a sound on screen and give you controls for adjusting those values with ease. As you make changes on the screen, you hear the results instantly from your instrument. When the sound sounds right, you can save the configurations either directly in your synthesizer memory or on disk for later downloading.

Getting just the sound you want from your synthesizer remains a demanding art, but editing programs make the mechanics as painless as possible. Editing programs are particular; you'll need one that's made

specifically for the MIDI instrument you use.

Though they look just like synthesizers, stand-alone digital sampling devices work differently. Instead of generating sounds from scratch as synthesizers do, samplers record sounds digitally and then let you play them back at any pitch. While it's easier to create a wide range of sounds with a synthesizer, a sampler gives you access to harmonically complex sounds, from grand pianos to trash can lids, that most synthesizers simply can't duplicate.

Stand-alone digital sampling devices have their own editor programs, though they work a bit differently than their synthesizer-oriented counterparts. A sample editor lets you view and manipulate a sample's actual harmonic content, not just the numeric settings you work with in a synthesizer editor. With packages such as Digidesign's Sound Designer or Blank Software's Alchemy you can remove hisses or hums from the sampled sound with surgical precision, adjust equalization, or select loop points (using a short looping section of a sample for sustained tones conserves precious sampler memory). And with Digidesign's TurboSynth, you can even sculpt entirely new sounds from scratch, turning your sampler into a high-powered synthesizer.

Synthesizer Housekeeping

Like surfers chasing the perfect wave, few synthesizer or sampler owners can resist the constant allure of new sounds to add to their collections. Even though many modern synthesizers can store the equivalent of several orchestras, most electronic musicians soon fill the available storage space and need a place to park their spare sounds.

With *librarian* software, you can file away as many sounds as you have disk space for, and you can group sounds by type (woodwinds, brass, sound effects, and so on) or according to their use ("syrupy June wedding sounds"). Again, each synthesizer model requires its own librarian.

Today, packages for the most popular synthesizers and other MIDI devices combine editor and librarian functions. Opcode's preeminent series of well-integrated editor/librarians covers over 20 machines. The screens of most of the Opcode editors are busy, but they're well-organized, and the programs offer several convenient methods, both mouse and Mac keyboard, for changing sound settings.

Dr. T's new Mac editor/librarians are just as functional as Opcode's but have a cleaner, less cluttered look. Since they achieve this look by splitting up the sound settings over more windows, however, you'll have to do a bit more window switching.

Even if no one makes an editor for your prize synthesizer, you should be able to find a package with librarian-only functions on Opcode's extensive list. If you have more than one synthesizer in your MIDI system, you can combine the appropriate Opcode librarians into a single program to minimize disk switching.

For owners of digital samplers, Alchemy offers many sophisticated librarian functions, including a feature that lets you record and store samples at the highest possible sonic resolution and then convert them to the format of any compatible sampler.

Scoring Big

If you read and write standard musical notation, or want to learn how, the Mac can give you tools for building compositions with conventional musical symbols: staves, clefs, key signatures, and so forth. Notational software boasts some important advantages over scribbling out notes with pen and paper, but you may find it has a few negatives as well.

For example, don't expect to be able to input music much faster than you could write it by hand. While these packages bend over backwards to make adding new notation easier, it still takes longer to choose a note's pitch, rhythmic value, and position with the Mac than it does to dash it off on paper. Many notation programs enable you to input music directly from a MIDI keyboard, and some can notate files

Jam Session One of Jam Session's canned bands. You solo on sax, piano, or

bass from the Mac keyboard.



recorded in MIDI sequencers, but you'll still usually have to do a substantial amount of editing to make the finished product look the way you want it to.

You will pick up efficiency, though, when you start to make changes and corrections to a developing score. Instead of a big eraser or a bottle of white-out, all it takes is an agile mouse hand to remove an errant note or alter a harmony. To notate repeating passages, you can simply copy and paste, transpose your selection if need be, and then touch it up as appropriate for its new musical context.

Notational software's ability to play your music while you compose it counts as another big plus. With a good multitimbral MIDI setup, you no longer have to put together an orchestra to hear how the piece will sound as a finished arrangement. When it does come time to give the piece to real musicians, you can print it using a PostScript font and make stunning, publishquality manuscripts. If you're writing for an ensemble, you can have the software print out each instrument's part separately, properly transposed to the appropriate key.

Beginners, or those who just want to get their feet wet, can choose among several reasonably priced notational programs, including ConcertWare+, Music-Works, StudioSession, and Deluxe Music Construction Set (DMCS). They all have particular strengths, but among the budget notation-oriented programs the best choice for scoring chores per se is unquestionably DMCS, which should be available in version 2.5 by the time you read this. DMCS is unmatched in its class for its array of vital manuscript elements, including slurs, ties, tuplets, and common dynamic markings. The program is appropriate for lead sheets, four-part vocal arrangements, and other moderately complex compositions. And it's no slouch for music playback, offering multitrack output with the Mac's own synthesizer voices or through MIDI.

Serious composers, arrangers, and songwriters should look to still more sophisticated—and pricier—notational tools, which offer wider selections of musical symbols and more powerful editing control. (For more information on notation programs, see "Music Processing: The Next Generation" in the July 1988 issue of Macworld).

The Music Lesson

If you can't tell a triad from a tritone, the Mac can help fill in the gaps in your musical education. The ability to recognize intervals, melodies, rhythms, and chords by their sounds is a fundamental musical skill, but it's one that most people acquire only through long hours of practice. Getting that practice has always been a major problem; human instructors don't have the time to drill individual students, and tape recordings are cumbersome and inflexible. Music software can serve up as many ear training drills as you care to tackle and can tailor them to emphasize the particular areas where you need work.

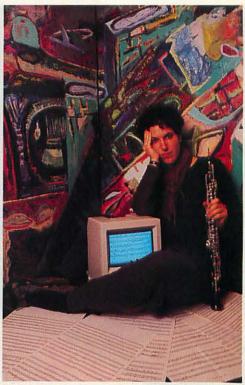
Resonate's excellent Listen 2.0, for example, plays intervals, melodies, or chords (including the ninth, eleventh, and thirteenth chords used extensively in jazz) with the Mac's own sounds or using MIDI. You pick out what you think are the matching notes on a keyboard or guitar fretboard on the screen, or on a MIDI keyboard, and Listen gives you immediate feedback on your accuracy. You can control how difficult the musical questions are, and if you like, Listen gives you hints, telling you whether your incorrect responses are too high or too low.

Listen won't help if you need practice in identifying rhythms or in notating the sounds you hear. For honing these skills, you can turn to Ars Nova's Practica Musica, another well-designed ear-training program. While Practica Musica lacks Listen's chord drills, otherwise it's a complete eartraining course that tests your ability not only to identify intervals, melodies, and rhythms but also to notate them on a standard musical staff. Other program exercises cover sight reading and chord spelling (you're given the name of a chord, and you have to "spell" the notes it contains). In many of the drills, the program automatically drops you back to easier material when you start to get answers wrong.

The Well-Tempered Studio

When you're new to the Mac or to music, or both, it makes sense to start with one or two simple software products and explore their possibilities fully while learning more about your computer, electronic sounds, or music theory. Once you have some experience under your belt, you may be tempted to inclulge your musical habit by putting together a Mac-supervised studio. A carefully assembled collection of programs can work together to take you painlessly all the way from that tune running through your mind to the finished composition.

Once your home studio is in place, you might start a typical session by using



Kathy Geisler, oboist with San Francisco's Visible Symphony, likes composing on the Mac because "it lets me immediately bear and edit my musical ideas."

your librarian program to select the sounds that will go best with your song, perhaps with a turn at an editing package to hone a sound or two until they perfectly suit the mood you want to create. Then move to the sequencer, to enter themes and experiment with harmonies and arrangements. As the piece takes shape, use the sequencer to add transitions, repetitions, and variations in a flash. Eventually you will have a polished creation, ready for the tape recorder. Transferring the file to a notation program, you add expressive instructions, touch up the music for looks, and print it out. Tape and printed score in hand, you're ready for the record company, the Library of Congress, or at least your own circle of musical compadres.

See Where to Buy for contact information.

Formerly a regular contributor to Keyboard magazine, Steve Cummings is a writer who makes sporadic appearances on electronic keyboards in a San Francisco Bay Area band.



The Compact Mac

The Mac IIcx: Apple puts the power of a Mac IIx in a smaller, quieter box and comes up with the Mac II you always wanted. But can you afford it?

by Lon Poole

ou like the Mac II and the Mac IIx for their speed and expandability but hate how they commandeer desk space, blow noisily, look like generic computers, and cost so much. Enter the Mac IIcx; there's more to like and less to dislike.

Technologically the Mac IIcx breaks no new ground. It is a refinement of Macintosh models that have gone before it, notably the II and IIx. From a consumer standpoint, it is a major new machine and a compelling one. Apple's product managers and engineers listened to what you and I liked and didn't like, and they built a machine that will please many of us. Too bad Apple marketing couldn't make it more affordable.

Look It Over

As you can see in "II Long, II Short," the new Mac IIcx looks like a compact, or cut-off, Mac II. If you put an Apple monochrome monitor atop a IIcx, the combination looks a lot like a classic Macintosh. If you have a wider monitor, you can set the IIcx on its side and put the monitor alongside. The four rubber feet are easy to move from the base of the IIcx to its side. The case has been carefully designed to work in a horizontal or vertical orientation. If you'd rather have the IIcx off your desk, you can set it on the floor, put it on a shelf, or hang it from the wall using a special bracket that Apple says will be available from third parties.

The case is made of plastic with a metallized interior for radio-frequency shielding. Air vents are located on the front and back; there are no air vents on

the sides or the bottom and only noncritical vents on top. A large-diameter cooling fan moves air from front to back without making much noise.

Look Inside

Inside the box are a floppy drive, a hard disk (most likely optional), a speaker, a logic board, and a power supply. One pleasant but not so obvious improvement over the Mac II is that the entire machine can be disassembled quickly for efficient servicing (see "Five Easy Pieces").

Once the IIcx has been disassembled, you can easily see all the components on the logic board (see "IIcx Logic Board"). The three NuBus slots on the Mac IIcx logic board are identical to the six slots in a Mac II or Mac IIx. However, there is slightly less headroom in a Mac IIcx, and the cutout in the back panel is a bit shorter. All NuBus boards that meet the physical specifications published by Apple at the March 1987 introduction of the Mac II work in the IIcx. Apple has found only a few boards that don't fit, and has alerted the manufacturers to the problem.

The IIcx has eight Single Inline Memory Module (SIMM) slots for memory. You can expand to 8MB of RAM using 120-nanosecond SIMMs widely available today. Those are the same SIMMs used in the Mac IIx and Mac SE/30. Apple has successfully tested the IIcx with 4MB SIMMs. When they become available, you will be able to increase the total memory capacity of the IIcx to 32MB. There's plenty of headroom to accommodate tall SIMMs.

The IIcx has the same 256K ROM as the IIx and SE/30, but the ROM chips are soldered directly to the logic board to reduce manufacturing costs. This ROM includes color QuickDraw, so it supports color and

The screen images used on the cover and within the article were developed by Duane Maxwell, Craig Davidson, and Janice Cornforth, with software from Pixar and Digital Dreams, on a Mac II equipped with a Levco Translink II.

Features and Specifications

	Modular			Compact
	Mac IIcx	MacIIx	Mac II	Mac SE/30
Processor	68030	68030	68020	68030
Memory Management Unit	integral	integral	optional 68851 PMMU	integral
Processor cache	instruction and data	instruction and data	instruction	instruction and data
Math coprocessor	68882	68882	68881	68882
Clock speed	15.6672MHz	15.6672MHz	15.6672MHz	15.6672MHz
Maximum RAM*	8MB	8MB	8MB	8MB
ROM	256K replaceable with SIMM	256K SIMM	256K socketed chips	256K SIMM
Internal floppy drives	i i i	1 or 2	1 or 2	1
External floppy drives	1	0	0	1
FDHD (SuperDrive) support	yes	yes	no	yes
Half-height internal hard disk	3.5 in.	5.25 in. or 3.5 in.	5.25 in. or 3.5 in.	3.5 in.
Internal expansion slot	3 NuBus	6 NuBus	6 NuBus	1 030-Direct
Video display	not included	not included	not included	built-in 9-in. b&w
Color/gray-scale support	yes	yes	yes	yes
Sound output	stereo	stereo	stereo	stereo
Power	yes**	yes**	yes**	yes**
Dimensions (in inches)	5.5 x 11.9 x 14.4	5.5 x 18.7 x 14.4	5.5 x 18.7 x 14.4	13.6 x 9.6 x 10.9
Footprint (in square inches)	171.4 or 79.2	269.3	269.3	104.6
Weight (in pounds)	14	24-26	24-26	19.5

^{*} Using 1MB SIMMs.

gray-scale monitors. The ROM can be upgraded if necessary by removing a jumper cable and inserting a ROM SIMM into the socket provided for it.

The logic board in the IIcx also contains the Apple Sound Chip (ASC), which provides 8-bit digital stereo sampling at 44.1kHz and includes four-voice wave-table synthesis. The same ASC is also present in the Mac IIx and SE/30. Sound is output through the front-facing internal speaker or through the audio jack on the back panel.

II Long, II Short

A Mac IIcx is about 6½
inches narrower than
a Mac II.

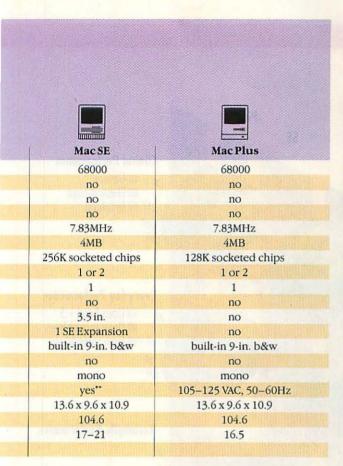


A Mac IIcx has a self-adjusting worldwide power supply; you can plug the IIcx in anywhere in the world and it adjusts itself to the local electricity. A replaceable battery on the IIcx's logic board backs up a small amount of memory, known as Parameter RAM, which retains user preferences set via the Control Panel. On the back panel is the power switch, which can be locked on so that the Mac IIcx restarts itself in the event of a temporary power outage—even if the battery isn't working. In contrast, a Mac II or Mac IIx won't restart itself under the same conditions.

Slowing Down at Thirty

Like the Mac IIx and the Mac SE/30, the Mac IIcx uses a 68030 microprocessor and a 68882 numerics coprocessor, both running at a clock speed of 16MHz. At 16MHz the 68030 doesn't offer much performance advantage over the Mac II. You can buy 68020 accelerators for the SE that operate at 25MHz and outperform Apple's 68030 offerings. One potential item of concern is that the 68030 on the Mac IIcx is soldered to the system board and not socketed like the CPUs in the II and the IIx. This means that down the road, upgrading to a 68030 with a faster clock speed may not be as easy to implement as, for example, the DayStar 68030 upgrades for a Mac II.

^{**} Worldwide power supply automatically configures itself to local electricity.

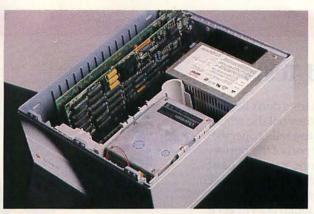


The key to the updated microprocessor in this new breed of Macs is that the 68030 (in contrast to the 68020 used in a Mac II and on a number of accelerator boards) has a built-in Paged Memory Management Unit (PMMU). The PMMU makes the Mac IIcx ready now for future Macintosh System software that will feature true multitasking. You can add a separate PMMU chip to a Mac II and to a few SE accelerator boards, but most accelerator boards require their own on-board RAM, and they limit the amount of system-board RAM used (see "Processors: Is Faster Better?" in last month's *Macworld*). However, until Apple releases such a System version, only A/UX can take advantage of the PMMU. Apple does plan to release an A/UX-equipped version of the IIcx.

Driving the IIcx

The internal floppy disk is Apple's Floppy Drive High Density (FDHD), also called the SuperDrive. The same drive is used in the Mac IIx and Mac SE/30 and can be retrofitted to a Mac II. The disk-controller chip, called the SWIM (Super Wozniak Integrated Machine), allows the FDHD to read, write, and format 400K, 800K, and 1.4MB Macintosh 3½-inch disks. Using the Apple File Exchange utility software, the drive also reads and writes MS-DOS 3½-inch disks formatted at 720K and 1.44MB.

The internal hard disk, if one is installed, must be a 3½-inch half-height disk. Full-height disks and 5¼-



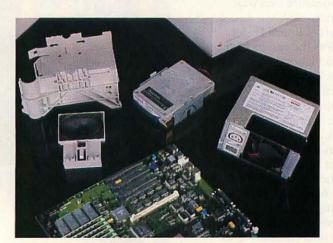
Inside the IIcx
By eliminating 3 slots
and using only 3½inch drives, the Mac
IIcx saves deskspace—
even when lying flat—
in comparison to the
wide-bodied Mac II
and Mac IIx.

inch disks do not fit due to space limitations. These larger disks can be installed in a Mac II or IIx, which means that these machines can accommodate internal disks that are faster and provide larger storage capacities.

See How It Runs

Using a Mac IIcx for less than an hour—mostly to conduct benchmark tests—didn't give me much of a feel for the machine's performance. But the benchmark tests provide some clues. "Speed Tests" graphically presents the results of the benchmark tests and describes the tests in detail. Keep in mind that these benchmarks only provide a rough indication for comparing performance. Actual results may vary depending on the way you use your computer, the configuration, and a number of other variables. The tests are useful for spotting relationships and patterns, not for making a definitive product evaluation.

A Mac IIcx virtually ties the performance of a Mac IIx and a Mac SE/30. No surprise there, considering all three models have a very similar hardware architecture. As you'd further expect, a Mac IIcx is enough faster than a Mac II that you'd notice the difference in some activities but not in others. The new machine handily beats the socks off a Mac SE or Mac Plus.



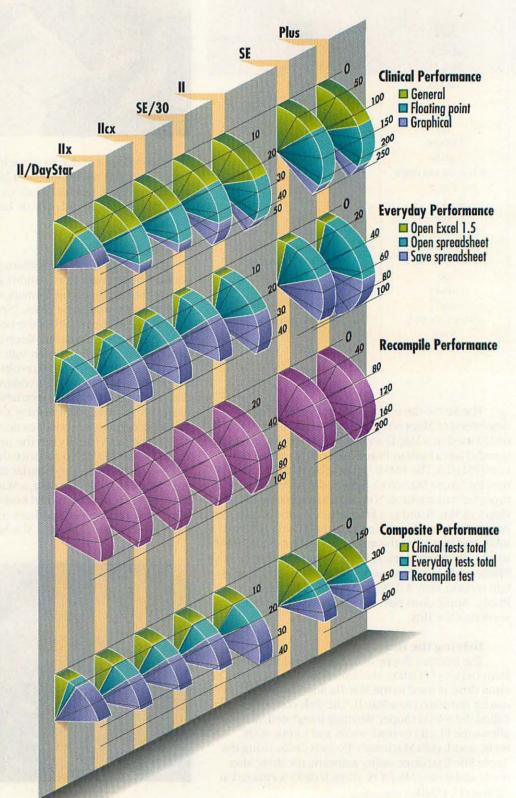
Five Easy Pieces
The IIcx disassembles
quite easily, but remember, internal
modifications abrogate Apple's generous
90-day warranty.
Clockwise from the
case, the interior components shown include the power supply, logic board,
speaker, disk-mounting bracket, and hard
disk.

Speed Tests

Benchmark tests don't lie, but neither do they tell the whole truth. Each test tells a specific truth about part of the performance picture. You and I must connect the dots of truth to see the whole picture, hoping there are enough dots to get it right. Here for your viewing pleasure are the results of seven benchmark tests designed to reveal performance trends among the six standard Macintosh models and the fastest Mac alive, a Mac II with a DayStar 33/030 Accelerator II.

All test computers had 2.5MB or more of RAM (none of the tests could use more than 2.5MB of RAM) and were started up from the same 30MB hard disk. The System Folder contained System 6.0.3 and Finder 6.1 but no start-up documents (INITs). MultiFinder was not used and the RAM Cache was off. Where applicable, color was off and the gray levels were set to 2 (1 bit per pixel). The DayStar 33/030 accelerator board had a 68882 numerics coprocessor. Variations in hardware and software configuration can markedly affect the test results, particularly for tests that measure everyday performance.

The chart "Clinical Performance" plots the results of several abstract laboratory benchmark tests. The General benchmark is the sum of the times for three tests: the standard Sieve of Eratosthenes (100 iterations), a selection sort on 1000 seven-character text strings that were in reverse order, and the multiplication of two 64-by-64-integer matrices. The Floating Point benchmark adds the results of two floatingpoint (decimal-number) tests. The first performs 10,000 addi-

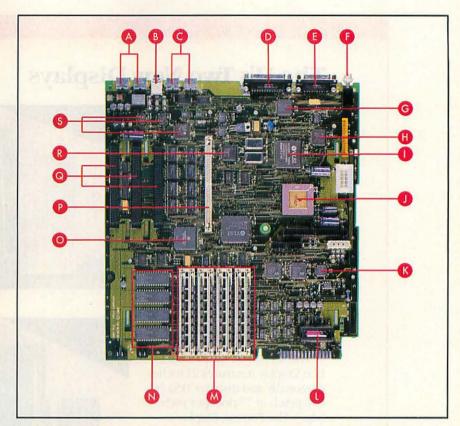


tions, subtractions, multiplications, and divisions. The second floating-point test, the standard Savage test, executes 1000 times a calculation involving the mathematical functions Tan(), ArcTan(), Exp(), Ln(), Sqrt(); and also contains a multiplication and an addition. The Graphical benchmark measures the time it takes to draw 200 circles, each alternating black and white, plus the time it takes to draw 2000 squares, alternating black and white. A special application written by Macworld contributing editor Bruce F. Webster conducted and precisely timed all the clinical tests.

Although clinical tests are very accurate, they do not always directly relate to the real world. The chart "Everyday Performance" assesses how quickly the different Macintosh models accomplish typical tasks. It graphs the times (the average of three stopwatch timings) for opening Excel 1.5, opening a 235K spreadsheet in Excel, and saving that spreadsheet.

Another practical test of performance, though not one many people experience daily, is recompiling a computer program. The chart "Recompile Performance" compares times (again the average of three stopwatch timings) for TML Pascal II, running under the Macintosh Programmer's Workshop (MPW), to recompile all its unit interfaces (some 20 files).

The chart "Composite Performance" gauges overall performance by totaling the times of all the tests for each machine. It confirms what makes sense intuitively: a faster microprocessor makes a faster computer.



Make Your Choice

Macintosh pricing reflects the fact that Apple likes to classify its Macintosh products by cabinet design. The compact Macintosh products include the Plus, SE, and SE/30 (and formerly the original 128K and 512K). The modular Macintosh products include the II, IIcx, and IIx. Which of these will tempt you to flash your cash at an authorized Apple dealer?

A Mac Plus is the only answer if cost alone matters. Although the Plus has no internal expansion slot, third parties have devised boards and internal hard disks for it. The Mac SE is noticeably, but not startlingly, faster than the Plus. It's also more expandable, having an expansion slot, an internal hard disk mounting bracket, and a robust power supply to handle internal accessories better. You can install an accelerator board in an SE to make it as fast as, if not faster than, any standard Macintosh now on the market.

If the portability of a compact Mac is important to you, and you want the performance and longevity of Apple's latest technology at the lowest possible price, then you should select a Mac SE/30. Unlike a plain SE, an SE/30 has color QuickDraw built in, so you can easily add a color monitor.

An SE/30 may be as fast as a IIcx, but the IIcx has three NuBus slots and multiple postures to win your heart and justify its higher price tag. Although at 14 pounds the IIcx is the lightest-weight Mac, Apple doesn't market it as transportable because it isn't part of the compact line. Nevertheless, the IIcx is eminently

IIcx Logic Board

A) ADB ports B) Audio port C) Printer and modem ports D) SCSI port E) Floppy disk port F) Lockable power switch G) SCSI controller chip H) SWIM chip I) Main GLU (logic circuitry) 1) 68030 CPU K) ADB controller chip

L) Replaceable battery M) RAM SIMMS N) ROM

O) 68882 FPU

P) ROM SIMM slot

Q) NuBus slots

R) Serial ports and AppleTalk controller

S) Sound chips

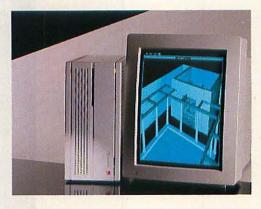
The II's Two New Displays

Apple has a reputation for crisp, distortion-free video monitors. Two new monochrome gravscale monitors shown at the preview of the Mac IIcx appear to live up to that reputation. The Portrait Display shows one full page, and the Workstation Display shows two full pages, including the menu bar, a window title, and horizontal and vertical scroll bars. The pages can be 81/2 by 11 inches or international size A4, vertically oriented. "Full-Page Portrait" and "Two-Page Landscape" show the two new Apple monitors.

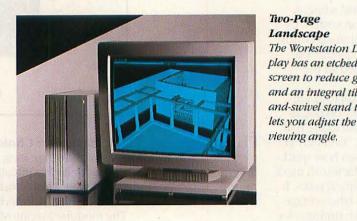
The screen on the Workstation Display measures 21 inches diagonally and displays 1152 by 870 pixels at 77 dots per inch (dpi). The Portrait Display's screen measures 15 inches diagonally and displays 640 by 870 pixels at 80 dpi. For comparison, the Apple High-Resolution Monochrome Monitor that's been around for two years has a 12-inch screen that displays 640 by 480 pixels at a more standard 72 dpi.

Like Apple's smaller monochrome monitor, both new monitors can display true grayscale shading. The amount of RAM on the monitor's companion video-display board determines how many shades of gray the monitor can display. The Portrait Display requires its own special video-display board, and so does the Workstation Display.

Ergonomically, both new monitors feature a high refresh rate of 75Hz to minimize flicker and eye fatigue. They also have flat screens with square edges for the least distortion and best focus near the edges. Both monitors come with 6-foot power cords so you can place them away from the Macintosh.



Full-Page Portrait The Portrait Display has three ADB connectors; you connect one to the Macintosh and connect the keyboard and mouse to the other two, letting you place the system unit several feet from the keyboard and the monitor.



Two-Page Landscape The Workstation Display bas an etched screen to reduce glare and an integral tiltand-swivel stand that

Apple is also introducing three new video-display boards, all of them NuBus boards that fit a Mac II, IIx, and the new IIcx. Two of the boards go with the new monitors. Both of these boards include enough memory for 2 or 4 shades of gray (1 or 2 bits per pixel) and can be expanded with more memory for 16 gray shades (4 bits per pixel). The third board is for the 12-inch Apple monochrome monitor.

The board includes only enough RAM for black-andwhite (1 bit per pixel) display and cannot be expanded for grays. The board and 12-inch monitor together provide—at the lowest cost for a Mac II, IIcx, or IIx—the same-quality display as the built-in screen on a Mac SE.

Exact prices were not final at press time, but should be \$2600 to \$3000 for the Workstation Display together with its video board, and \$1300 to \$1800 for the Portrait Display together with its video board. The Workstation Display should be available by the time you read this; the Portrait Display is scheduled to ship in May. The 1-bit video board for the 12-inch monochrome monitor is expected to cost \$200 to \$250.

Apple does not provide video boards that permit the use of either of the two new monitors with the Mac SE or SE/30. Conceivably, third-party vendors could provide SE video boards for these monitors.

transportable, say between work and home, if all locations have monitors. (Monitor prices start at \$399.) Without a monitor—or with a flat-panel display—you can easily stow a IIcx under an airline seat. Unfortunately there aren't currently any flat-panel displays available for the IIcx (attention third-party developers). The IIcx also has more expansion options than the SE/30, thanks to the wealth of NuBus boards in existence. The operative word here is *versatile*. Apple president John Sculley and IIcx product manager Fred Benz often uttered it when they previewed the new machine to the press.

Paying the Price

Macintosh prices took a roller coaster ride last fall and winter, and Apple profits and stock prices followed along. Apparently still reeling from that trip to the midway, Apple marketing had not finally decided on prices or configurations for the Mac IIcx at the press preview. At that time Benz said the Mac IIcx price would be the same as, or less than, a comparably equipped Mac II. Sculley put it this way, "Three slots and a smaller footprint, or six slots and a larger footprint, are roughly comparable trade-offs. So the prices are going to be fairly comparable." Sculley also said the Mac SE/30 will continue as the lowest priced 68030-class Macintosh. The cheapest IIcx will therefore cost more than a stripped-down SE/30. This pricing philosophy will disappoint the many potential Mac II buyers who hoped Apple would take a smaller Mac II as an opportunity to offer them the real price break they've been wanting for so long. They may see a three-slot IIcx as more comparable in value to a one-slot transportable SE/30.

Apple is going to make a pile of money selling the Mac IIcx, and for good reason. Development costs had to be low compared to most other models because the IIcx borrows so heavily from other models. In addition, manufacturing costs have to be among the lowest for any Macintosh. I suppose the price has to be high to fit with the rest of the product line and to fit with Apple's image as the Häagen-Dazs of personal computers.

Which Mac II?

Based on Apple's fabulously vague price positioning, the Mac IIcx should easily finish cooking the Mac II's goose, a job begun last October by the Mac IIx. Although Apple will continue to make the Mac II "as long as demand warrants," there seems little reason to buy one. Anyone who needs more than three slots surely needs 4MB of RAM, and at this writing, a 4MB Mac IIx is a better deal, with or without a built-in hard disk, than an equivalently equipped Mac II. According to Apple, the vast majority of Mac II and IIx users only fill one or two slots. Without a doubt most of these users would pick a Mac IIcx over an equivalently priced Mac II. To keep the Mac II alive, Apple must lower its price or at least not introduce a bare-bones IIcx. Otherwise no one will buy a Mac II, once supply of the IIcx



Bebind the IIcx
The back panel of the
Mac IIcx includes,
from left to right, a
floppy disk port, a SCSI
port, two serial ports,
an audio jack, and
two ADB ports. Two of
the cutouts in the upper right have been removed to access NuBus
board connectors.



Typical Mac IIcx User

As Apple's senior vice president of R&D and product marketing, Jean-Louis Gassée was in a unique position to influence the design of the computer he chooses to use in his own office.

catches up with demand. Perhaps then we will see a drop in the price of a IIcx and an even steeper drop in the price of basic Mac II configurations.

In the meantime, the IIcx captures center stage in the Mac product line. Apple foresees the Mac IIcx's becoming a focal point for product evolution. Like the SE in the compact Macintosh product line, the IIcx will become a new design center within the modular Macintosh product line. Presumably you can expect to see new machines in the future based on the IIcx of today. What the upgrade paths will be to those new models only time will tell, but Apple has always tried hard to provide upgrades at what it considers a fair price. Demand for the IIcx will be high, because it is the Mac so many people have wanted for so long. It's reasonably compact, fairly quiet, expandable and versatile, fast, and for this month at least, the latest thing.

See Where to Buy for contact information.

Lon Poole is a Macworld contributing editor and the author of HyperTalk and Mac Insights, both published by Microsoft Press.

137

Statistics
programs
that help
you
analyze
numbers

with graphics

Picturing Statistics

by Charles Seiter

ver the last two decades, powerful new graphics-based ways of looking at data have evolved. In the last two years, Mac statistics software has matured in a way that capitalizes on this trend, and in the process has made the Mac a powerful force in statistics. The trend can be categorized as exploratory data analysis: a collection of graphing and plotting principles intended to make relationships between pieces of data stand out visually. Instead of crunching sets of numbers down into barely-more-informative statistical summary tables, the newer approach relies on a preliminary graphical inspection of data to determine which traditional computational methods show the most promise for interpreting the data.

The five statistical packages examined here—Data Desk Professional 2.0, Exstatix 1.01, StatView 512+, StatView SE+Graphics/StatView II, and Systat 3.2—exemplify this trend. Aside from making these programs more useful than traditional calculation packages, this influence makes them fun to use, particularly compared to the mainframe statistics programs most people encounter in undergraduate courses. Each package has strengths and weaknesses in

the main areas of interest to statisticians: education, economic analysis, market research, engineering, and science. One additional package, MacSpin 2.0, is covered separately because it is a special-purpose program.

StatView 512+

The most popular program to date, StatView 512+, from BrainPower, offers solid statistical analysis geared for the 512K Mac; the graphics are fairly limited by current standards. It's reasonably comprehensive and features a well-designed interface (see "StatView 512+"). Because of these virtues it has sold nearly 8000 copies. Abacus Concepts, the developers of 512+, sold the marketing rights for the program to BrainPower and then went on to develop StatView SE+Graphics and StatView II.

A look at "Vital Statistics" shows the basis of 512+'s popularity: it provides a lot of statistics for a reasonable price (\$349.95). The program's main shortcoming is the omission of cluster analysis and time series analysis, but most of the tests offered by encyclopedic systems (for example, Systat) are present. 512+ is convenient for doing conventional 2-D plots—it supports the boxplots and cellulation techniques that formed the basis of early exploratory graphing methods—but it lacks the rotatable views of newer statistics programs.

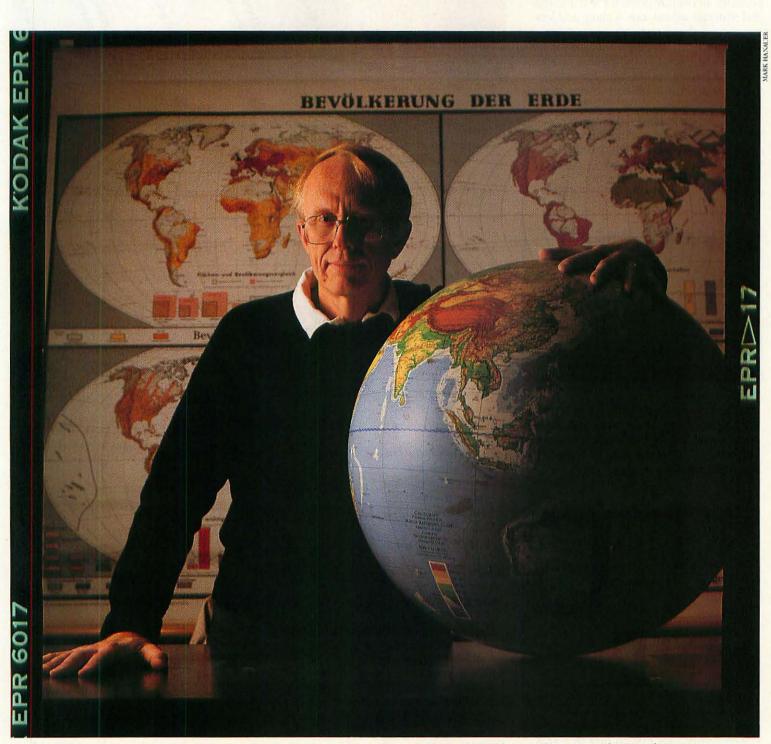
Exstatix 1.01

The newest of these programs, Exstatix, by Select Micro Systems, can run on a 512K. Unlike StatView 512+, it offers color support on a Mac II and better windowing; its ANOVA (Analysis of Variance) capabilities are basic, but it offers rotatable 3-D views.

Exstatix supplements the standard tests found in beginning statistics courses with simple time series analysis. One of the program's particularly strong features is reporting: Exstatix prints summary reports, with explanations of the meaning of the tests, to a report window for convenient use in word processing documents.

Unlike StatView 512+, Exstatix does not explicitly support repeated-measures ANOVA. The selection of nonparametric statistics, on the other hand, is slightly more extensive than 512+'s.

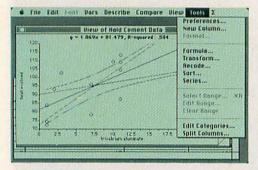
Exstatix also computes basic descriptive statistics and a variety of calculational intermediates. In practice, this means that most results are posted as fast as you can select a test, even for data sets consisting of several thousand records. This is especially important since Exstatix does not explicitly support the 68881, but only supports the coprocessor through SANE.



Dr. William Bowen of Cal State Northridge likes Exstatix's graphics and its smooth interface with Select Micro Systems' geography program.

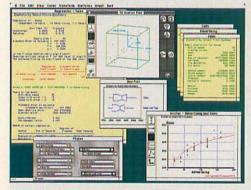
The program is compact enough to use under MultiFinder. It performed with no problem on a Mac SE with Word. A layout facility allows you to customize graphs; provides an overlay plane for text and legend material; allows axis scaling; and lets you choose data-point styles, line styles, and fill patterns. All graph features can be specified in color. Finally, Exstatix provides a 3-D scatterplot option (see "Exstatix") that amounts to a simplified version of MacSpin.

While Select Micro Systems has provided guidelines for adding user-developed tests, it has no plan to develop new tests of its own. The company is working with third parties on further test development.



StatView 512+

Along with the expected statistical tests, StatView 512+ offers a respectable array of facilities for transforming data and implementing database-like functions. This plot shows confidence limits in a simple regression analysis.



Exstatix

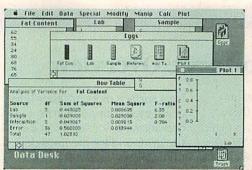
This image shows the usual data-table-andreport—style analysis, and also a rotatable 3-D scatterplot—in color. Exstatix runs on a 512K Mac, but takes advantage of the Mac II to produce a variety of elaborate color plots.

Vital Statistics	ž,	12.0	ž		
	Econamy 1.01	Data Desk Professional 2:0	Santien St.	Station of the state of the sta	\$595
List price	\$349.95	\$495	\$349.95	\$495	\$595
Descriptive					
mean, standard deviation,					
minimum/maximum	•	•	•	•	•
frequency distribution,					
percentiles	•	•	•	•	•
Comparative					
paired, unpaired t	•	• 11	• 1	•	•
one-way ANOVA	•		()	•	•
complete ANOVA tables	•	•	•		
n-way ANOVA	•	•	•	•	•
repeated-measures ANOVA			•	•	
Sheffé test	•				•
Multivariate					
analysis of covariance		•			
factor analysis		•	•		•
principal components			•	•	•
discriminant analysis					
Regression	MANAGEMENT /				
linear	•	•	•	•	•
general nonlinear			•/-	•	•
polynomial	•	•	•		
multiple linear			•	•	
Correlation					
Kendall rank	•		•	•	•
Spearman rank-order	•	•	•	•	•
Pearson					•
Data manipulation					
functional express	•		•		•
spreadsheet-style editor	•		•	•	•
Cluster analysis					
hierarchical		•			•
single-linkage		•			•
complete-linkage		•			•
centroid-linkage					•
Time series					
autocorrelation	•				•
moving average	•				
Box-Jenkins ARIMA					•
Fast Fourier transform					•
lin, nonlin smoothing					•
Nonparametric					
Wald-Wolfowitz	•	•			•
Mann-Whitney U			•		
Kolmogorov-Smirnov	•		•		
Wilcoxon signed-rank			•		
Kruskal-Wallis	•				
Lilliefors					
Goodman-Kruskal				Sumpression	
Friedman					
McNemar Cochran O	¥**********		•		Harman and a second
Cochran Q					

Data Desk Professional 2.0

The champion of exploratory graphics, Odesta's Data Desk Professional is the friendliest statistics program around; it sports several advanced test features (cluster analysis, for example) but offers only simple facilities for presentation graphics. This program is intended to improve your statistics knowledge as you work. Odesta has produced an exemplary three-part manual (Quickstart, Handbook, and Statistics Guide); no other package on the market is likely to be as useful to nonspecialists.

Besides the standard tests, Data Desk Professional includes facilities for examining the effect of individual data points on summary statistics. There is probably no other program with comparable ability to examine the impact of outliers or anomalous data points. Data Desk Professional was designed to use the concepts of Professor John Tukey, of Princeton University, who first advocated the idea that it is easier to see important correlations by looking at appropriate graphs than by inspecting numerical tables of correlations or ANOVA data. Thus Data Desk Professional best integrates exploratory graphics capabilities and encourages you to use a variety of plotting methods, including 3-D plots that can be rotated, sliced, brushed, and regrouped.

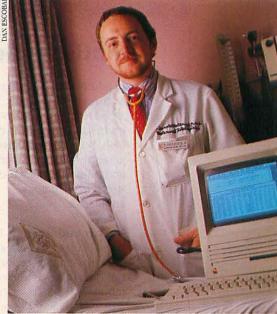


Data Desk

Data Desk Professional uses a flexible data representation (individual icons represent data fields as in Double Helix II). This figure shows a simple ANOVA analysis and a dotplot.

Data sets are stored in *work bundles*, which display icons for all the individual sets of data variables, transformed variables (these functions of data are typically "hot" and change automatically as data changes), and stored plots (see "Data Desk").

Selecting data by icon is faster and more convenient than scrolling through a list in a dialog box. To call up a scatterplot of one variable against another, you simply select the icons for the two variables in the work bundle window and choose Scatterplot from the Plot menu. When pressed, the



Dr. Harold Holbrook of Stanford University Medical School uses StatView II to analyze research and patient data.

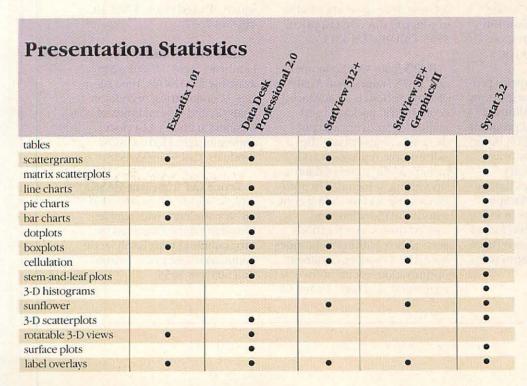
HyperView button (a small triangle) in the resulting plot window suggests a calculation of correlation and regression statistics for your plot.

Odesta and Data Description (the program's developer) have done an outstanding job of producing a modern, graphics-oriented statistics package that is as useful to professionals as it is inviting to neophytes.

StatView SE+Graphics/StatView II

Abacus Concepts has taken Stat View 512+ and has added a professional presentation package that includes color support, upgraded data import/export, and math coprocessor use. It offers the same test menu as StatView 512+.

StatView SE+Graphics and StatView II are the latest results of the continuing evolution of StatView 512+. The main distinction between the new programs and StatView 512+ is the integration of presentation graphics (see "Statview SE+ Graphics and II"). All three programs offer the same statistical tests, and the StatView SE+Graphics package even includes the StatView 512+ manual in addition to its manual covering presentation graphics. The distinctions between SE+Graphics and II are math coprocessor support (II has it, SE+Graphics doesn't) and color (supported in both, but II's color palette is more extensive).



Statistics Software Overview

In addition to the programs featured in this article, there are several other statistics programs available for the Macintosh. Some of these provide general statistics capabilities and others are designed for specialized statistics applications.

Chipendale from True BASIC. A specialized social science statistics program for building tables and crosstabulating data. List price: \$49.95. Call 603/298-5655.

CLR ANOVA from Clear Lake Research. Designed for variance analysis, this versatile program can handle unequal sample sizes and up to ten factors. List price: \$75. Call 713/523-7842.

MacSpin 2.0 from D² Software. In MacSpin 2.0, statisticians can look at clouds of data points rotating in 3-D, to see whether the points cluster in certain directions or regions, indicating a correlation or other relationship.

While it is not a statistics program as such, MacSpin 2.0 goes far beyond the capabilities of any other commercial program in this one area. Rotation is particularly fast and smooth, as MacSpin uses proprietary screen update routines that bypass QuickDraw. In MacSpin you can code data sets by color to indicate data subsets (including color coding values by user-defined ranges). MacSpin ro-

tates surface plots or other lineconnected data-point arrays and allows color selection for the grids and for the lines defining the surface. List price: \$300. Call 512/454-7746.

MacSS from StatSoft. An older general statistics program, it was being extensively revised by StatSoft at press time and was unavailable for review. List price: \$245. Call 918/583-4149.

Monte Carlo Simulations from Actuarial Micro Software. The leading professional statistics simulations package for engineers and actuaries (insurance statisticians), it covers in greater detail some of the same areas as the business programs Crystal Ball and Best Answer. MCS simulations can employ a large array of related randomvariable distributions for rapid simulation of events whose outcome is difficult or impossible to simulate directly. List price: \$595. Call 919/773-1313.

RATS from VAR Econometrics. RATS (Regression Analysis of Time Series) is an advanced econometric package used mainly for studying and predicting business trends. Besides simple regression and most possible types of data smoothing, it includes hypothesis-testing and modeling commands. RATS includes advanced time-series methods such as Box-Jenkins techniques for ARIMA models, nonlinear optimization, vector autoregression, and forecasting. Offers spectral analysis (for use on synthesized complex series) with Fourier transforms and inverse Fourier transforms, and a few windowing functions so the package could be used for some scientific and engineering applications in a pinch. List price: \$300. Call 312/864-8772.

StatCalc from Clear Lake Research. A HyperCard-based statistics calculator, StatCalc includes descriptive statistics, t- and F-tests. List price: \$22.50. Call 713/523-7842.

Statistics for Excel from Heizer Software. A specialized set of Excel macros that covers regression, *n*-way correlation, ANOVA (1-way with repeated measures, or 2-way single-observation), and simple non-parametric statistics (Mann-Whitney U). The macros also compute familiar distributions and functions (normal, chisquare, F). List price: \$79. Call 415/943-7667.

Statistics Modules from Lionheart Press. Modules are available for ANOVA, time series, econometrics, regression analysis, and several types of business statistics. List price: approximately \$100 for most modules. Call 514/933-4918.

TrueSTAT from True BASIC. A basic statistics "construction kit" for students, with simple tests that can be extended by programming with BASIC-style commands. List price: \$49.95. Call 603/298-5655.

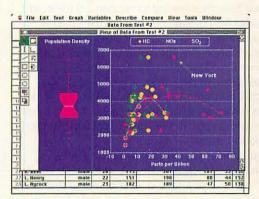
The Graph menu contains most of the new features of SE+Graphics and II. The original StatView's graph types have been upgraded to allow detailed control through long hierarchical menus—of point type, line width, shading, chart scaling, and fill patterns. You can overlay legends and other text (with arrows connecting text to points of interest in a plot), and insert tables directly into a graph. The organizing principle for chart modification is the separation of each graphic into four superimposed planes: Background, Statistics, Drawing, and Legend. In both programs you can control the artwork on each plane to design your data presentation for maximum impact.

The Import command in 512+'s File menu has been enhanced in SE+Graphics and II with a background program that evaluates imported data intelligently. For example, you can bring an Excel file into SE+Graphics or II, and those programs automatically distinguish variables from categories and assign correct variable names.

Systat 3.2

Systat, from Systat Inc., is the only Mac product that is nearly equivalent to large mainframe packages (BMPD, SPSS). It offers a truly comprehensive array of statistics and monochrome graphics; but its use of command lines rather than Mac-style menus makes it hard to learn.

While the StatView programs are easy to use and visually powerful, Systat is comprehensive. Every test in standard undergraduate statistics textbooks can be found



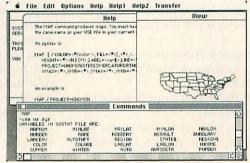
StatView SE+Graphics and II

The plots (polynomial regression, notched boxplot) in StatView SE+Graphics and StatView II are the same as those in StatView 512+, except that Abacus Concepts' upgraded program enables you to manipulate the plotted image. in some module of Systat. If you need a test that isn't there, such as Cochran's test or Mantel-Haenszel, Systat includes its own version of BASIC for programming that function yourself.

Systat's breadth and its compatibility with PC and minicomputer programs are reasons for choosing the program. Despite a wonderful manual that incorporates Leland Wilkinson's informative views on statistical practice, Systat takes effort to use. It retains the command-line style of its non-Mac predecessors. The authors of Systat correctly point out that for performing repetitive data processing, rather than exploratory analysis, this method is significantly more efficient than using icons and menus (see "Systat").

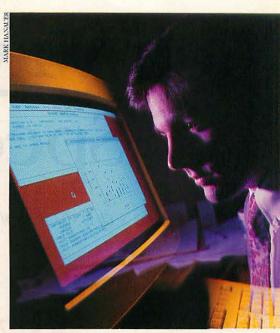
Version 3.2 introduces two significant advances toward an improved Mac interface. First, Systat now features a datamanagement system that supports the usual cut, copy, and paste functions. Second, the View window now allows you to plot a set of graphs and page through them on screen. The extensive facilities (including excellent 3-D plotting) that were offered piecemeal in earlier versions are now notably more manageable with the addition of the View window.

Systat also includes a demo program, Mystat (available separately for \$3), that shows Systat's planned interface for future versions. Mystat has a complete interactive Macintosh interface, with nearly complete graphing features, icon menu choices, and a basic assortment of statistics. Fastat, a more elaborate program with a business statistics emphasis, is being developed to bring Systat's power to more people.



Systat

Though Systat's Map function is sophisticated, allowing selection of regions and expression of data, effective use of Map demands that you master a fussy command-line syntax.



Dr. Chris Nardo of Immunetech Pharmaceuticals uses Systat for tracking and analyzing results of experimental drug testing programs.

The Final Analysis

All five programs reviewed in this article are easier to use, better at output graphics, and better at exploratory analysis than any program was—for any computer in the world—four years ago. Systat is probably the leading program for academic statistics, StatView SE+Graphics and StatView II are the business graphics leaders, and Data Desk Professional leads in exploratory statistics, but it should be noted that the old standby StatView 512+ and newcomer Exstatix offer impressive arrays of facilities for their modest prices. The developers of these packages, in fact, tend to openly admire each other's work, hoping to capture a particular market segment rather than dominate the field. All of these programs incorporate trends in analysis that make statistics more accessible, and it

See Where to Buy for contact information.

Charles Seiter is a chemistry-professor-turnedcomputer-writer and a Macworld contributing editor. He's written several books on programming languages and financial modeling.

Ten Ways to Speed Up a Mac

Here's a list of bottleneck symptoms and solutions that can help you cure a sluggish Macintosh

by Lon Poole

hen it comes to speeding up the Mac, you have lots of choices. Leaf through the ads in this issue and you'll see accelerator cards, memory, fast disk drives, and software to boost performance. You could buy each type of enhancement or you could spontaneously pick a few, but either approach would probably waste your money. This article helps you decide which types of enhancements to get, and in what order to get them. Some solutions make your working habits more productive; others physically speed up your system.

Strained Floppy Disk Drives

Nothing slows you down faster than running out of disk space. With today's burgeoning System software, application programs, and documents, it's easy to strain two 800K floppy disk drives. You need higher disk capacity if you observe any of the following symptoms.

- Bouts of disk swapping punctuate your work on any but the smallest documents, or when you cut and paste between applications.
- Your floppy disks multiply at a rate that would astonish bacteria in a petri dish.
- Start-up disks never have enough space for the fonts you want or for utility software such as desk accessories, Control Panel devices, and INITs.

Hard Disk Drive

To eliminate disk swapping and speed up the time it takes for the Mac to access data, use a hard disk drive. (see "Disk Drive Performance"). Hard disks range in capacity from 20 megabytes (the equivalent

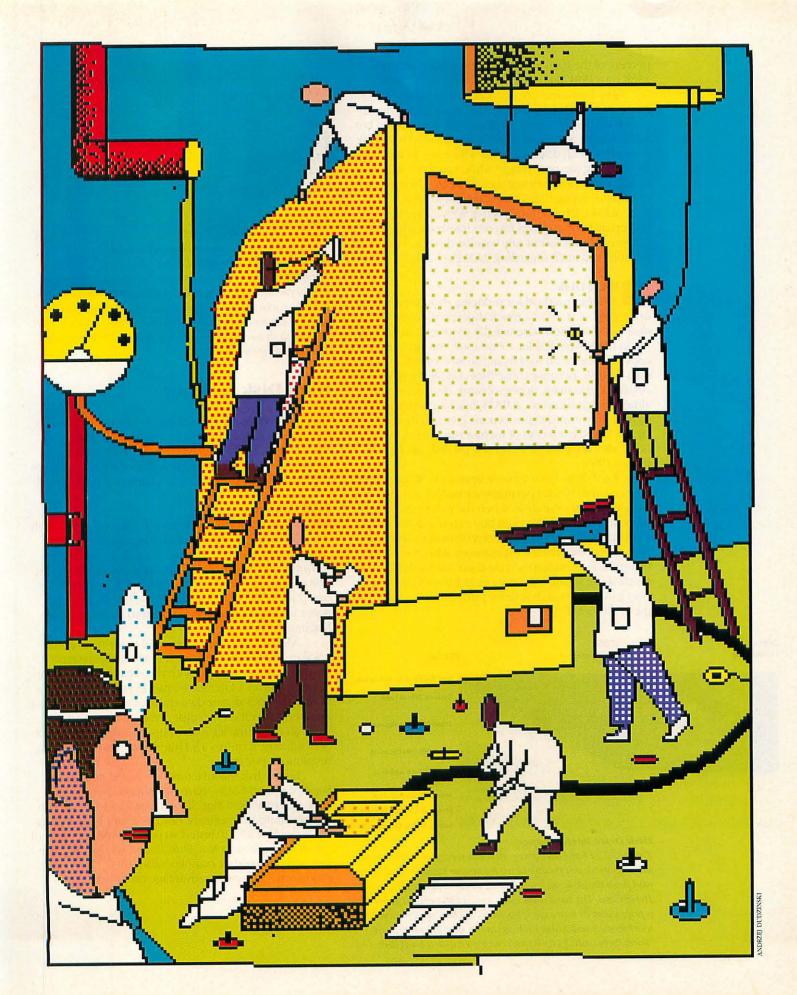
of 25 floppies) to 600MB and more. Drives that attach to a Mac's SCSI port are significantly faster than ones that attach to the Mac's external disk drive port. For example, an Apple Hard Disk 20 is not much faster than an 800K floppy disk. (You can upgrade a Hard Disk 20 so that it uses the Mac's SCSI port with Personal Computer Peripheral's HD-20 WSI adapter kit.) If your 128K or 512K Mac doesn't have a SCSI port, your dealer can install a SCSI adapter.

RAM Cache

RAM Cache
You can boost the speed of any disk drive by turning on the RAM Cache option of the General device in the Control Panel. If your Control Panel doesn't have a RAM Cache setting, then you need to update your System software to version 2.0 (System 4.1 and Finder 5.5) or later. The cache uses part of the Mac's random-access memory (RAM) to keep a copy of information the Mac recently accessed from a disk. Should the Mac need the same information again, it can retrieve the information more quickly from the cache in memory than from the disk. If the Mac needs information not in the cache, it gets it from disk and leaves a copy in the cache, replacing the stalest information there.

Gauging the efficiency of the RAM Cache is largely a matter of feel. You can put a stopwatch to simple tasks, such as opening a document from the Finder and immediately quitting (see "Open and Quit with RAM Cache"). However, such tests don't measure cache efficiency during real work. Actual efficiency depends on what applications you use and how you use them. Apple recommends you use no more than 25

Lon Poole answers readers' questions and offers advice in bis monthly Macworld column. Many of the tips he's compiled can be found in his book Mac Insights (Microsoft Press, 1987).



percent of the total available memory (for example, 256K on a 1MB Mac).

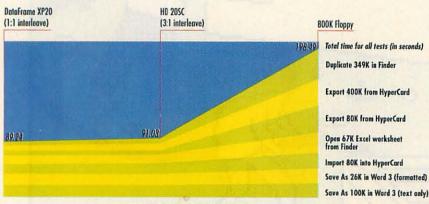
The best measure of cache performance is the percentage of disk requests filled from the cache. Apple's RAM Cache doesn't provide that information but Turbo Cache, a replacement cache included with disk drives from PLI, does report an efficiency percentage. By watching the percentage while you work with lower and lower memory settings, you can determine a minimum setting that's most efficient for you.

RAM Cache is not effective with all applications. HyperCard, for one, has its own internal caching scheme. Always follow any specific directions in an application's manual regarding RAM Cache use.

RAM Disk

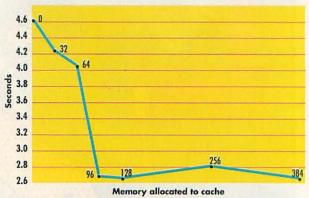
Another method for reducing disk activity is to use some memory as a mock disk drive, called a RAM disk. RAM disk software usually requires you to put a file in the System Folder. Commonly this file contains a copy of some or all files from the System Folder of the start-up disk, because those files contain fonts, desk accessories, and many other software resources used by almost all applications. A RAM disk large enough to significantly improve performance is usually 600K or larger. In today's world of memory-hungry applications, allocating memory for a RAM disk can be a real sacrifice.

RAM disks have a major limitation. Whatever you save on them has no permanence unless you also save it on a conventional disk. When the power goes, so does the RAM disk. You can buy external RAM disks. They have the performance of a conventional RAM disk but contain their own memory. Also, they have battery-power backup so you don't have to worry too much about losing information. But if they only connect to an external disk drive port, then you can't use them with a Mac II.



Disk Drive Performance

The two SCSI bard disk drives in this test proved seven times faster than the floppy disk drive for simple transfer of data to and from the disk, such as reading or writing a text file from HyperCard. The hard disks were about 150 percent faster than a floppy disk at more complex tasks, such as opening an Excel worksheet. Some tasks, such as saving new documents in Word, were only 25 to 50 percent faster with a bard disk.



Open and Quit with RAM Cache

The efficiency of a RAM cache increases as you assign more memory to it, until you reach 25 percent of the total memory. Here the cache was tested by opening a MacDraw document from the Finder and quitting immediately without using MultiFinder. Tests were performed on a standard Mac Plus with an Apple Hard Disk 20SC.

Hard Disk Languor

Hard disks have a few diseases, all of which impede the transfer of information to and from the disk. You may be right if you think your hard disk has slowed down over the last few months. There are several steps you can take to bring a sluggish hard disk up to speed.

Reformat
A hard disk drive operates at peak efficiency only if it is formatted for the specific Macintosh model to which it is connected. Formatting a drive establishes its interleave ratio; that is, the number of disk revolutions required to read or write all the information on one track of the disk. The fewer the revolutions, the faster information can be transferred to or from the Macintosh.

All hard disk drives can read or write an entire track in one revolution, which is an interleave ratio of 1:1. A Mac II can keep up with the data-transfer rate resulting from a 1:1 interleave ratio. However, a Mac SE's SCSI port has a slower data-transfer rate and requires a 2:1 interleave ratio (two disk revolutions to read or write an entire track). A Mac Plus or a Mac 512K with a SCSI adapter requires a 3:1 interleave ratio (three disk revolutions per track).

Some disk manufacturers—including Jasmine, SuperMac, and CMS—have developed special software that enables a Mac SE or a Mac Plus to work with the optimum 1:1 interleave ratio. For simple data transfer, SuperMac's XP20 tested 40 percent faster using a 1:1 interleave ratio on a Mac Plus. But when opening, saving, and doing other complex tasks, the 1:1 interleave ratio seems to have no advantage on a Plus.

A mismatched interleave ratio reduces hard disk performance drastically. For example, a drive with a 1:1 interleave ratio effectively has an interleave ratio of 17:1 when connected to a Mac Plus, because the drive must go around the block several times while waiting for the Mac to be ready for another block of information (see "Improper Interleave Format").

Remove Fragmentation

All hard disks eventually suffer from file fragmentation. A fragmented file is one that is scattered in little pieces across the disk instead of being located in one continuous segment. Fragmentation slows disk performance by forcing the drive to shop all over town instead of going to one store.

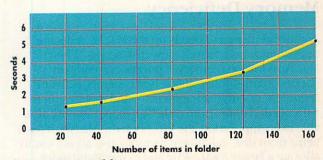
Fragmentation is usually at its worst when a disk is nearly full and you've been deleting and adding to it for months. The effect on disk performance becomes noticeable when about 10 percent of the files are fragmented. You can determine the percentage of fragmented files with utility software such as Disk Express or the HD Tuneup feature of the Symantec Utilities.

To consolidate fragmented files, you can back up all files one by one, reformat the disk, and restore the files from the backup. Or you can fix fragmentation without reformatting by using Disk Express or HD Tuneup. You still need a backup, however, in case something goes wrong during consolidation.

Rebuild DeskTop File

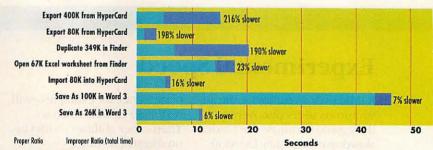
If you use a large hard disk containing thousands of files, you may notice the Finder slowing down.

Copying a 5K file to the hard disk may take minutes instead of seconds. The Finder slows down when its invisible DeskTop file gets too large. The DeskTop file tracks housekeeping information such as the position of icons in windows and Get Info comments.



Time to Open Folders

The fewer the number of items in a folder, the faster the Finder opens the folder. Leaving folders with numerous files open also slows down the Mac whenever you restart or close an application.



Improper Interleave Format

To see how severely an incorrect interleave ratio reduces hard disk speed, I formatted an Apple Hard Disk 20SC on a Mac II (at 1:1 interleave) using Apple's HD SC Setup utility. Then I tested it on a Mac Plus. The drive operated much slower than if it were formatted for the Plus (at a 3:1 interleave ratio).

You can tell when the DeskTop file has become swollen by watching the messages in the progress monitor box while copying or duplicating a file. If you get the message "Updating the desktop file ...," you should rebuild or compress the DeskTop file.

To rebuild a DeskTop file, press Option-\(\mathbb{H} \) when you start up the Mac or when you quit an application while not using MultiFinder. Rebuilding a DeskTop file loses all comments you have typed into Get Info boxes. Comments automatically provided by applications are not lost.

You can compress a DeskTop file without losing your Get Info comments using Disk Express. For an experimental solution to the problem, see "Experimental Speed." To really solve this problem, Apple needs to improve the Finder's handling of the DeskTop file.

Reorganize

What appears to be a slow disk drive may actually be inefficient file and folder organization. My tests show that the Finder takes almost four seconds more to open a folder containing 160 items than one containing 20 items (see "Time to Open Folders"). If you leave any such folders open, the Finder takes the extra time every time you start up the Mac or quit an application while not using MultiFinder. You can leave full folders closed, or you can move some of the documents and applications in them to other folders. For faster Finder operation, use nested folders and keep the number of items in each folder to 50 or fewer.

Printer-Induced Coma

Adding a hard disk drive won't make an ImageWriter or LaserWriter print faster. After you click OK in a Print dialog box, the Mac waits comatose, trickling pages to the printer and leaving you ample time to get thoroughly distracted before you can get back to work.

Experimental Speed

A little over a year ago some adventurous users discovered they could eliminate the Finder slowdown caused by Desktop file congestion. First they copied the Desktop Manager file from an AppleShare file server or the AppleShare System Installer disk to the System Folder on every start-up disk. Next, they restarted without MultiFinder, started an application, and used a desk accessory such as Disktools Plus to delete the invisible Desktop file from all the disks to which they copied the Desktop Manager file. Again they restarted their Macs, pressing #-Option. The Desktop Manager created two invisible files to take the place of the Finder's invisible Desktop file.

Several repercussions have come to light about using the Desktop Manager to speed up the Finder. For one, applications or desk accessories that rely on the Desktop file to start other applications—Finder re-

placements, for example—will no longer be able to do so. Their other abilities should be unaffected, however.

In addition, the Desktop Manager opens two files from each disk the Finder sees, and it leaves them open until you shut down or restart the Mac. Therefore you cannot dismount hard disk partitions or eject removable hard disk cartridges unless you use the MountEm FKey (available on Compu-Serve). You may also have trouble using disk utility applications or restoring a disk with a backup application. If so, make the utility the start-up application and restart the Mac.

Lastly, the Finder may be unable to find the application to open a document when you double-click on the icon. You should be able to cure this problem by dragging the application into the folder that contains the document you want to open, opening the document,

quitting, and then returning the application to its original location.

Note: It's important that you put the Desktop Manager file in the System Folder of every start-up disk. If you just do some disks, eventually you'll end up with both the Desktop Manager's two invisible files and the Finder's invisible Desktop file. One or the other set of files will be incomplete, and you could end up effectively scrambling your disks.

Warning: Apple doesn't authorize or support using the Desktop Manager except on an AppleShare file server. Nor does Macworld endorse the technique, although it is presented here in good conscience. You use it entirely at your own risk. Although many people have used the technique successfully for over a year, you could be the first to lose the contents of a hard disk.

Use a Print Spooler

Print spooler software (also called background printing software) intercepts page images on their way to the printer and saves them quickly on disk-preferably a hard disk. Then whenever you leave the Mac idle (for instance, between keystrokes), the spooler software sends the saved images as the printer is ready. The only side effects are sporadic brief delays in mouse or keyboard response.

Apple includes background printing software for the LaserWriter with MultiFinder. But you can buy a better spooler that works with an ImageWriter, a Laser-Writer, or an AppleTalk ImageWriter. SuperLaserSpool saves page images to disk faster than Print Monitor (the spooler that comes with MultiFinder) and is less obtrusive about sneaking time to send spooled page images to the printer. In addition, since SuperLaser-Spool does not require MultiFinder, you can use it on Macs with only 1MB (see "Waiting to Print").

Memory Deficiency

Additional memory speeds up the Mac by reducing its dependence on relatively slow disk access. When a Mac runs low on memory, it purges currently unneeded items—fonts, dialog box contents, software segments, document fragments—and replaces them with needed items from disk. The more memory available to an application, the less often the Mac must fetch items from disk. Additional memory also allows you to allocate a larger RAM cache and to use MultiFinder.

Add SIMMs

Add SIMMS
Adding more memory to a Mac Plus, Mac SE, or Mac II is simple: replace 256K SIMMs (Single Inline Memory Modules) with one or more 1MB SIMMs (see "Room to Grow" in the March 1988 issue of Macworld. and "Installing Memory" in the May 1988 issue). When you buy SIMMs, pay attention to their memory access

times. A Mac II requires 120-nanosecond memory, whereas a Mac SE or a Mac Plus can use slower and cheaper 150-nanosecond memory. Using faster memory than required does not improve performance. If you buy 120-nanosecond memory for a Mac Plus or a Mac SE, however, you can take it with you should you later trade up to a Mac II.

Make sure you buy SIMMs that physically fit with any other accessories installed inside the Macintosh. Apple's SIMMs have memory chips soldered directly to the SIMM, a process called *surface-mount technology*. Because surface-mountable memory chips have been scarce and expensive, some SIMM suppliers use memory chips inserted in sockets that are soldered to the SIMM. SIMMs with *socketed* memory are taller than surface-mount SIMMs and may collide with adapter cards in a Mac SE and with some internal hard disks in a Mac II.

If you have a Mac 128K or a Mac 512K, you can increase its memory to 1MB or more using a variety of products, including adapter cards, upgrade kits, and logic board swaps.

Slow Processor

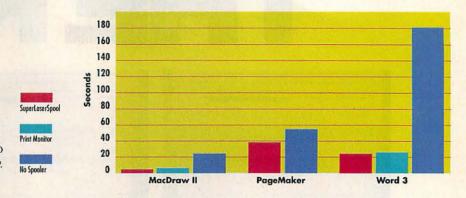
If you still want faster performance after installing a SCSI hard disk, print spooler software, and more memory in your Mac, perhaps your Mac's standard processor is not fast enough. The following symptoms suggest that the Mac is processor-bound:

- Slow scrolling (without disk activity)
- Slow redrawing of windows and graphics, especially with complex drawings, large screens, color screens, or screen extender software
 - Slow printed-page imaging or pagination
 - Slow recalculation of spreadsheets
 - Slow cut-and-paste of large selections

Install Accelerator

To increase processor speed, you must install a more powerful processor and perhaps a math coprocessor. The standard processor on a Mac 512K, Mac Plus, and Mac SE is a Motorola 68000 running at a clock speed of about 8 MHz. You can add an accessory card that contains a replacement 68000 processor running at about 16 MHz to any of those Macs. Doubling the clock speed doubles the speed of screen redrawing, calculations, and other activities that keep the processor busy. But communications with disk, keyboard, mouse, and serial ports take place at the slower rate. The task at hand may degrade the theoretical 100 percent performance increase to 20 percent or less.

You can also accelerate a Mac SE by transplanting the Mac II's 68020 processor and 68881 math coprocessor. A 68881 speeds math-intensive tasks—not just



Waiting to Print

Printing with a print spooler frees the Mac 28 to 84 percent faster than printing directly to a LaserWriter IINT. A print spooler such as SuperLaserSpool is slightly faster than the Print Monitor that comes with the System. In my tests, however, Print Monitor (running on a 1MB Mac Plus) couldn't spool at all from PageMaker and couldn't print after spooling from MacDraw II due to lack of memory. SuperLaserSpool had no such trouble.

spreadsheets and statistics but graphic transformations such as 3-D rotations as well. (Most 68000 accelerator cards also include a 68881 as an option.) If you want to speed up a Mac II, you can replace its 68020 processor and 68881 coprocessor with the 68030 board.

Replacing the standard processor with a faster one improves overall system performance, but the degree of improvement varies greatly among different applications. For example, applications that rely heavily on disk access show less improvement than those that spend more time calculating and manipulating information in memory. Also, installing a faster processor doesn't make up for slow disk drives or too little memory. Don't bother accelerating the processor unless you already have a SCSI hard disk drive and more than 1MB of memory.

The Proper Treatment

Your Mac probably exhibits symptoms of several of the problems described here. If so, treat one condition at a time and reevaluate overall performance after each treatment. Start with disk drives. If you don't already have a SCSI hard disk, get one at least 50 percent larger than you think you need. If you have one, make sure it's performing at its best—no fragmentation or distended DeskTop file. Try using a RAM Cache. Definitely use print spooler software. Next, add memory to bring the Mac up to at least 2MB, 4MB if possible. If all else fails to achieve the performance you want, install an accelerator card. Stop upgrading when you're satisfied with the Mac's performance (or when you run out of money).

See Where to Buy for contact information.

THERIGHT



M20 20 Mb External



Economy. Mirror's great looks in a zero-footprint design that brings mass storage within anyone's budget, yet includes—free of charge as with all Mirror hard drives—Mirror's hard drive value package*. And with Mirror Technologies' return policy and one-year warranty, you can't go wrong.

*Includes Mirror Technologies' Hard Drive Value Package.



M30 30 Mb External



Our most popular drive. Enough storage for most personal applications at manufacturer-direct prices. Preformatted and easy to use—just plug in and play! Super reliable, and with all the extras at factory-direct prices.

*Includes Mirror Technologies' hard drive value package.



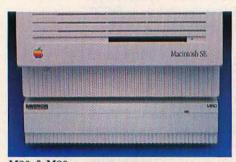
M40 & M40 + 40 Mb Externals



Your choice. Lower price or blistering speed. The "Plus" version screams along at an amazing 19ms! And our "Plus" drives carry a two-year warranty. Heavy gauge steel cases, the finest hardware, and power supplies that just won't quit.

*Includes Mirror Technologies' hard drive value package.

*Includes Mirror Technologies' hard drive value packa M40+: Call for price.



M80 & M80 + 80 Mb Externals

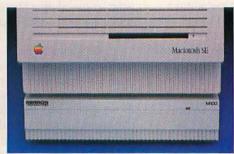
\$947

Again, your choice: high speed or lower price. We'll double our usual one-year warranty on the 19ms "Plus" drive to two years. 80 Mb is enough for highly complex networking and accounting applications. Shop the price on other 80 Mb drives. Ours is less expensive, and you still get all of the Mirror extras! *Includes Mirror Technologies' hard drive value package.

M80+: Call for price.

Our numbers look as good as our products.

It's because you buy straight from the manufacturer. No commissions. No markups. Just prices up to 40% less than you'd pay in a computer store. You still get all of the extras like our hard drive value package. And friendly, intelligent people who understand the MacIntosh.



M100, M200 100 & 200 Mb Externals

\$1197

Mega-memory at a micro price. And talk about speed! The M100 is fast, but the M200, at 15ms, is awesome! Fan-cooled reliability, and Mirror's conservative philosophy means you can't find a more secure storage medium. Preformatted. Just plug and play!

play!
*Includes Mirror Technologies' hard drive value package.
M200: Call.

*Mirror Hard Drive Value Package:

•Preformatted •Embedded SCSI; NTX compatible •AC EMI/RFI filters • Rear-panel AC outlet • External SCSI address selector • SCSI cable • Whisper-quiet cooling fan • Hard Driver * formatting and diagnostic utility • LaserSpeed * •Numerous other utilities, backup utility • 10 Mb of Public-domain software stacks •1-year warranty, two years on "Plus" drives.



RM.8 Floppy Disk Drive

\$167

We set the standards for low-cost removable storage. This little drive packs .8 Mb (800K) of data on each 3½ disk! MacWorld says of our RM.8, "So quiet it would be unobstrusive anywhere except a library on a Friday night." Try it for 30 days, and if you don't like it, we'll take it back. You won't find a similar brand-name product for less!

Quality is always a better value. Especially if it costs less.

Lost data can put you out of business. That's why Mirror Technologies uses only the best. And why we build in those extras that mean greater data security. When integrated with rugged power supplies and whisper-quiet cooling systems in our steel chassis, you can double-click "Save" with confidence.

THE RIGHT N 1-800-654



M60 60 Mb External



You won't find a brand-name 60 Mb drive for less. And you still get Mirror's EMI/RFI protection, heavyduty power supply, AC convenience outlet, whisperquiet cooling fan, rear-panel SCSI address, and other standard Mirror features. Compare. Then give us a

"Includes Mirror Technologies' hard drive value package.



VisionScan 200

A VisionScan scanner – an unlimited supply of art & graphics! Anything you can lay on the flatbed can be quickly and easily entered into and manipulated with your Mac at half the price of competing flatbed scanners! A BYTE reviewer wrote, "If it were my money, I'd buy the Mirror Technology VisionScan. Its price/performance ratio is unequalled".

VisionScan 300



VisionScan works as a DA so you don't have to exit the program you're using! Get the 200 dpi VisionScan 200 for excellent line art and affordable halftones, or the 300 dpi VisionScan 300 for excellent line art and excellent halftones, and we'll send you Zedcor's DeskPaint, free! Optical character recognition software available.



Internal Hard Drives: 30, 40, 80, 100, 200

Only Mirror Technologies allows you to add an internal hard disk in an SE already containing either two floppies or a floppy and a hard disk! Up to 200 additional Mb in your SE! And Mac II users can add two of our drives; up to 400Mb of internal storage, another Mirror exclusive!

40, 80, 100, & 200 Mb: Call.

Another number you'll love. 30 days at our risk.

We know you can't get a better value anywhere. It's up to us to prove it to you. Try a Mirror product for 30 days; if you don't think it's a great value, call us, send it back, and we'll refund the price of your unit. We're confident that you will like our prices, our products and our service.



RM20 Removable Flexxy Disk Drive

Think of it as a huge floppy disk. Using media developed by Kodak and Verbatim, the flexxy disks carry a lifetime guarantee! Speed? Our RM20 is as fast as most 20 Mb hard drives! An extremely low cost per Mb for backup, for archiving, or for your primary storage medium. And we sell our RM20 for over a

You'll get better help than from a computer store salesman.

If you need to know about any product, ask its maker. At Mirror, our Mac experts have been hand-picked and trained to be able to answer your questions. Better help than you'll get from salesmen in most computer stores. If you've ever had trouble getting help before, you'll find welcome relief at

hundred dollars less than the competition, complete with Hard Driver™ formatting and diagnostic utility, Symantec's LaserSpeed™ LaserWriter print spooler, and numerous other utilities, including a backup utility. External SCSI address selector, our whisperquiet cooling fan, built in AC EMI/rRFI noise filter.

You could be using a Mirror Technology drive tomorrow.

We almost always ship within 24 hours. If we don't ship within 24 hours of credit approval, we'll pay the freight! And with optional express shipping, you could be up and running by noon tomorrow. You simply can't find better products, with better service, at a better price - anywhere.

2644 Patton Road, Roseville, MN 55113 Phone: 612-633-4450 Fax: 612-633-3136 Hours: Mon.-Fri. 8 a.m.-6 p.m. CST

HOMES 19001-FT. A 8.I.H.-9 B.H. CSI
MacIntoshand Macure trademarks of Apple Computer,
Inc. LaserSpeed is a trademark of Symantee Corporation.
Vertatim is a trademark of Verbatim Corporation, a Kokak
company. Kodak is a trademark of Eastman Kodak
Company. DeskPaint is a trademark of Zedeor, Inc.
MacWorld is a publication of PCW Communications, Inc.
Byte is a publication of McGraw-Hill.



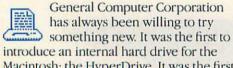
Circle 424 on reader service card

Reviews

WriteMove

Portable ink-jet printer for the Macintosh.

Pros: Tiny (10.8 inches by 6.5 inches by 2 inches); lightweight (3 pounds); dark, 192-dpi resolution; very quiet; runs on batteries; superb design. Cons: Sometimes forces postponement of print job; picky about paper; bigh-resolution printing only from proprietary fonts; expensive cartridges. Company: GCC Technologies. List price: \$699. Requires: 1MB; SCSI port; two 800K floppy drives; bard disk recommended.



Macintosh: the HyperDrive. It was the first to invent a low-cost laser printer: the Personal Laser Printer (PLP). Now it's even trying out a new name: GCC Technologies.

GCC's latest offering, the WriteMove ink-jet printer, is every bit as remarkable as the company's previous products but has fewer limitations. GCC is careful to market this astonishingly tiny, three-pound device as the printer for the person on the go. As such, the WriteMove is an unassailable success; it would be impossible to imagine a smaller, lighter, more concisely conceived machine.

A Dot Polka

The principle of the WriteMove's Diconix ink-jet printer (from which the WriteMove has been adapted), long established in the IBM world, is simple enough. A dot matrix printer like the ImageWriter has a column of tiny pins that strike the ribbon at precise moments as they travel across the page. In an ink-jet printer the pins are replaced by a column of tiny pinpoints in a thimble-size plastic container of ink. The printer spurts droplets of ink onto the page through these holes with the same precise choreography as that of the dot matrix printers.

Ink-jet printers in general have some distinct advantages over impact printers. First, they're nearly silent. Second, the resolution is better than that of 9-pin dot matrix printers; at 192 dots per inch (dpi), the WriteMove's output is halfway between the ImageWriter's (144 dpi at its best) and a laser printer's (300 dpi). A third advantage is that the images printed with an ink-jet printer are always jet black; there's no ribbon that can fade. In the case of the Write-Move, the ink cartridges don't last very long—after 100 pages or fewer, a \$10 car-

tridge gives up the ghost—but every one of those pages exhibits much darker blacks than the ImageWriter's printouts do.

The WriteMove printer has some other solid selling points, too. The most important is that it shares its font technology with GCC's PLP-it uses an outlinefont system from Bitstream. These fonts (which, unfortunately, must be installed in the system and used exclusively in order to get the WriteMove's high resolution) are stored in the Mac as mathematical formulas. As with PostScript fonts, that means you can enlarge or reduce any letter, word, or page in increments of 1 percent; and the printed letters will always be clean and smooth, no matter how jagged they look on screen. (Contrast this system with the ImageWriter's fonts, which only look good if you have the desired point-size font installed in the system.) In addition, Write-Move's fonts can be scaled, stretched, and rotated, just like PostScript fonts.

The WriteMove confers other blessings, too, as a result of its impeccable

"Inkjet Paper," High Quality

Times ABCD efgh 123456 bold, italic, bold italic
Helvetica ABCD efgh 123456 bold, italic, bold italic
Courier ABCD efgh 123456 bold, italic, bold italic
Swiss Narrow ABCD efgh 123456 bold, italic, bold italic
Zapf Calligraphic ABCD efgh 123456 bold, italic, bold italic
Symbol: ABXΔ εφη 123456 βολδ, ιταλιχ, βολδ ιταλιχ

Laser Printer Paper, High Quality

Times ABCD efgh 123456 bold, italic, bold italic
Helvetica ABCD efgh 123456 bold, italic, bold italic
Courier ABCD efgh 123456 bold, italic, bold italic
Swiss Narrow ABCD efgh 123456 bold, italic, bold italic
Zapf Calligraphic ABCD efgh 123456 bold, italic, bold italic
Symbol: ABXΔ εφη 123456 βολδ, ιταλιχ, βολδ ιταλιχ

Two Printing Samples

Text printed on the special clay-coated ink-jet paper that comes with the Write-Move is slightly blurry because the paper is so absorbent (top sample). The same image, a list of the standard Bitstream fonts supplied with the printer, when printed out on laser printer paper, is much clearer but takes longer to dry because the paper is so shiny and smooth (bottom sample).



No False Moves

The WriteMove is quiet, and unbelievably small and light; its print is jet black; and for text and some graphics, its images are much crisper than the ImageWriter's.

Diconix design. To insert a page into the ImageWriter, for instance, you must go through two steps: pull the paper bail back from the platen, and then, so that you can adjust the position of the sheet, set the pin-feed/friction-feed toggle switch on pin-feed (so the printer won't grip it). The WriteMove printer, on the other hand, automatically releases its rubber-platen grip on the page when you pull back the paper bail. In other words, it's smart enough to know that you intend to insert a sheet of paper, so it relaxes its friction hold until the paper is positioned correctly and you replace the paper bail against the platen.

Imagine, too, a printer that can run on batteries. How, you may wonder, is there room for batteries in a printer so small that it would rattle around in a large Wheat Thins box? Simple. The batteries go inside the platen.

Your Handsome Prints

The WriteMove comes equipped with the same fonts that come with the Personal Laser Printer. If you use regular Image-Writer fonts, the WriteMove's output will look precisely the same as an ImageWriter's, with two exceptions: first, the image will be blacker; and second, the Write-Move driver (which you select from the Chooser) provides a fairly effective Smooth Screen Fonts option.

The WriteMove printer handles graphics in several ways. If it's a QuickDraw image (otherwise known as an object-oriented or MacDraw image), its printout will be very crisp and clean, at 192 dpi. If you're printing a MacPaint (bitmapped) graphic, however, the printer is limited to reproducing what's on the screen, exactly as the ImageWriter does. The WriteMove, however, has a Smooth Bitmapped Graphics option, and can reduce or enlarge graphics from 25 percent to 400 percent; a reduced image prints at higher resolution.

The printing quality, however, depends upon the paper you're using. The sample of special clay-coated ink-jet paper provided with the printer produces poor results; it's so absorbent that the ink seeps in and spreads slightly, giving mushy outlines to the characters. Regular pin-feed paper, typing paper, or even stationery produces better results. Best of all, however, is shiny, smooth laser printer paper, which the WriteMove manual specifically suggests avoiding. But images printed on

this nonabsorbent paper, while extremely crisp and clear, take a long time to dry: just over a minute. I recommend that you use regular pin-feed paper for your drafts and print the finished copies on laser printer paper. You'll have to address envelopes by hand, however; the WriteMove can't help you there.

Writing the Wrongs

The similarities between GCC's Write-Move and PLP printers don't end with the font system and the decision to give Apple's mainstay printers a run for the money. The WriteMove, like the PLP, needs the Mac's memory and processor in order to operate.

This sometimes means you'll be informed that there's not enough memory to complete your printing job; at this point you have no choice but to exit the program and print the document from a separate Print Manager application. This can be infuriating. With a Mac Plus, the WriteMove can't print so much as a single card from HyperCard; you have to launch the Print Manager later in order to see the document you were trying to print.

The WriteMove is no speed demon, either; in general, it loses out to the ImageWriter in Best mode by a few seconds. The WriteMove does offer a fontless Draft mode, but this mode takes nearly twice as long as the blazing ImageWriter Draft mode.

A final concern is that this small, lightweight printer may not be sturdy enough for the long haul. It seems to be trustworthy, but it hasn't been available long enough to demonstrate how it stands up to heavy use. And it shares the problems that accompany any ink-jet printer, such as occasional clogs (which are simple to clear up), and the necessity to replace the cartridge frequently.

GCC is marketing the WriteMove as a secondary, portable printer; in this capacity, it is an outstanding product. It may even be worth owning as a primary printer. Its \$699 list price puts it within hailing distance of the ImageWriter II, making it a viable, Mac-friendly alternative to the ImageWriter. In selecting a WriteMove over an ImageWriter, you have better-looking documents to gain and little to lose: even with non-GCC fonts and bitmapped graphics, the WriteMove looks as good as the ImageWriter. This time, GCC has clearly made the right move.—David Pogue

See Where to Buy for contact information.

Microsoft File 2.0

Flat-file data manager. Pros: Much faster than File 1.0; includes templates for most popular commercial forms; offers easy mail merge with Microsoft Word. Cons: Lacks database linking feature; primitive file import/export. Company: Microsoft Corporation. List price: \$195.

Requires: 512K; two 800K floppy drives or 800K floppy drive with bard disk.

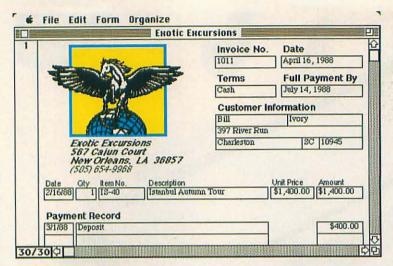
When Macworld reviewed seven flat-file data managers (see "Data Basics," June 1988) Microsoft File 1.0 didn't fare too well: the reviewer considered it simple to use, but slow and lacking in features.

File 2.0 is still simple to use, but it's fast and has many more features. Microsoft has apparently concluded that one way to database users' hearts is through their printers: the program includes a huge set of specially designed sample templates so File can output data on standard, commercially available forms. File 1.0's already simple interface to Microsoft Word's print merge function has been further streamlined. There's now a Text option (Microsoft Word merge) in the Save dialog box. Word's print merge recognizes data saved in this way. Microsoft's vision of the universe is remarkably straightforward compared to most other database vendors'. The folks at Microsoft seem to believe that people want database programs mainly to keep name lists, produce merge letters, and print stick-on mailing labels—and that they want to perform these tasks with Microsoft products (it's possible to do a File merge with MindWrite, for example, but it's not easy). For these list management tasks, Microsoft has made File the price/performance champion in its class.

First, Speed

Microsoft File 2.0 performs notably better than its first incarnation. This first impression is confirmed by benchmarking. In a 1000-record set, File 1.0 took 1 minute and 34 seconds to select 30 records; File 2.0 did the same task in 20 seconds. Searching for a single record, the times were: File 1.0, 24 seconds; File 2.0, 1.6 seconds. Apparent sorting speeds are 20 to 30 times faster in version 2.0 than in version 1.0.

I refer to "apparent" sorting speed because File 2.0 automatically indexes all sortable nongraphic fields. This accounts



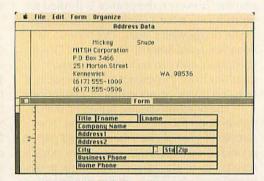
Getting through
Customs

All data fields and labels bave customizable fonts and type sizes, and File 2.0 supports graphics fields (including color graphics) too. This almost gaudy data record entry bints at the possibilities.

for the large size of saved files; 50K or so of tab-delimited text turns into 150K of file under File. You can specify that certain fields not be indexed, resulting in a little bit of saved space. (The manual still describes and cautions about "index documents," a feature dropped from File 2.0 apparently at the last minute.) Because you probably have more disk space than free time, you can consider these changes in File's search/sort strategy to be improvements. File is now as fast or faster than notorious speed demons FileMaker II and OverVue (and, presumably, OverVue's successor, Panorama) for most common file manipulations.

Next, Features

Some new features simply amend deficiencies in File 1.0, and some offer real pluses. Some basic fix-ups include zoomable windows, support for multicolumn labels, compression of blank spaces, and calculation with date formulas. In addition,



All That's Fit to Print

File 2.0 includes more than 100 predesigned templates for printing Deluxe and Avery forms on the LaserWriter or the ImageWriter. This example of a standard file card uses Avery Continuous Cards #4166.

File 2.0 now offers Memo as a field type. Memo fields can hold up to 32K's worth of characters, but cannot be searched, unlike text fields. The addition of Custom Setup and Custom Print commands, to accommodate odd paper sizes on ImageWriters and LaserWriters, is useful for printing labels.

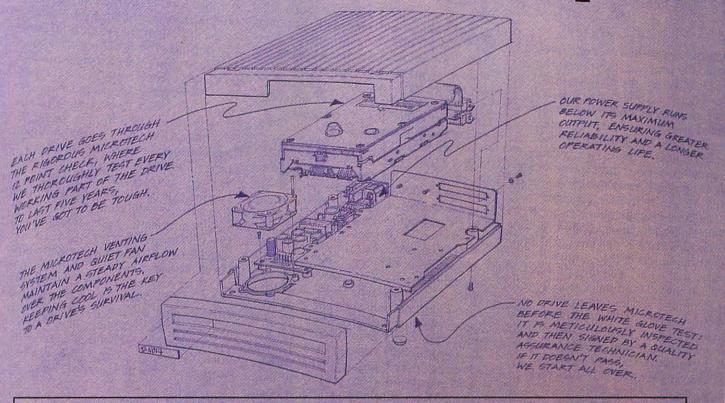
File 2.0 also supports networks (Microsoft expects you to buy a copy for each workstation), although File itself doesn't explicitly handle access privileges: AppleShare manages these.

Microsoft is currently bundling a macro program called AutoMac III (by Genesis Micro Software) with File 2.0. The program also includes a coupon that entitles you to a copy of SuperPaint by Silicon Beach. This way, reason the people at Microsoft, you can use AutoMac III to automate routine database procedures and SuperPaint to produce graphics that can be imported into database files as graphics fields for report and forms enhancement. Since these programs are clearly intended to bolster File's competitive position against FileMaker II, it's worth performing a direct comparison.

File 2.0 vs. FileMaker II

As already noted, File is now as fast as FileMaker for file-handling operations and perhaps faster for sorting and searching in large files. For typical files the increased speed is not an advantage, but at least it's there. File is also about \$100 cheaper at retail prices, translating into about a \$60 difference in street price. File's coordination with specific commercial forms for printing—order blanks for Avery and Deluxe products actually shipped with File documentation—is hard to match.

We challenge the competition to match our five year warranty. We'll even give them the plans!



Other manufacturers offer you a one, maybe two year warranty on their hard disk drives. Which probably tells you something about the way they make them.

Only Microtech gives you a five year limited warranty. And that says a lot about the way we make ours.

SIZE	ACCESS TIME	INTERNAL	EXTERNAL
20	65	N/A	\$ 520.00
40	19*	\$ 569.00	\$ 649.00
80	19*	\$ 919.00	\$1019.00
100	25	\$ 999.00	\$1099.00
150	16	\$1399.00**	\$1469.00
320	18	\$2699.00**	N/A

* Quantum's DisCache allows access times to drop as low as 12 ms.
** Available for the Macintosh II and IIx only.

So for quality, economy, and five full years of unmatched performance, insist on a Microtech hard disk drive.

For the rest of you guys, it's back to the drawing board.

Call now to place your order or for more information.

In fact, when you buy a Microtech internal or external hard disk drive for your Macintosh, you're getting the product of superior design. Top of the line components. Excruciating quality control. And the most dedicated service and support staff in the business.

Size for size, you're also getting the fastest drives available. Each one bundled with MacTREE Plus, the hard disk management system, and DS BACKUP. And all for the most competitive pricing around.



29 Business Park Drive, Branford, CT 06405

1-800-325-1895

© 1989 Microtech International, Inc. All product names are trademarks or registered trademarks of their respective owners.

The 5 year limited warranty is offered at no extra cost on hard disk drives sold and delivered in the U.S. or Canada. Certain restrictions and exclusions apply.

Terms and conditions of the 5 year warranty are available upon request. Prices and specifications subject to change without notice.

MasterCard and Visa accepted at no extra charge.



File for Reference

The File menu changes to show the options available when (left to right) a Report window, Form design window, or Datafile window is active. This important element of Microsoft's current interface style eliminates long, mostly grayed-out menus.

Despite the inclusion of graphics fields and the provision for speed through automatic indexing, the program is still pretty basic. Reporting facilities are still spartan and underdocumented. There are no math functions beyond arithmetic for computed fields. File imports and exports only through tab-delimited text, making it one of the few serious database programs than can't directly read or write Microsoft's own SYLK format for data exchange.

Database amenities are meager in File. FileMaker, for example, allows linking of its flat files in a way that is often helpful for duplicating sets of fields from one database to the next. File can't do this. FileMaker provides graphics tools for designing reports and forms as part of the program. In practice this is easier than switching between database and paint programs for simple graphics. And AutoMac III, nifty utility though it is, isn't as helpful as FileMaker's script facility for actual database work.

And the Winner Is . . .

If you need to perform complex database tasks but still don't need the full power (and attendant complexity) of a relational database, FileMaker II has the edge over File 2.0. But File is now the ultimate expression of the database as list manager for the Mac. If you need to produce mail merge documents with Word, and if your office already uses the standard business forms explicitly supported by File, this program should be your first choice. Microsoft has made File a superior performer of the routine chores required by a large part of the database market.—Charles Seiter

See Where to Buy for contact information.

Cricket Paint 1.0

Black-and-white bitmapped graphics program. Pros: Extremely intuitive and polished; allows you to edit up to 300 dpi at page sizes up to 11 by 17 inches; permits you to resize and reshape new objects in context of drawing; outstanding manual. Cons: Overpriced; some frivolous new tools. Company: Cricket Software. List price: \$195. Requires: 1MB; two 800K drives or bard disk.



Fortunately for the Macintosh world, some companies just won't listen to reason. Take

Cricket, for example, which made what might seem like a shockingly misguided business decision: to introduce a new paint program. No color, no PostScript, no object-oriented layer. Just a black-andwhite, bitmap MacPaint clone.

With the well-entrenched MacPaint, FullPaint, and other bitmap programs to compete with-not to mention bitmapand-object editors like SuperPaint, Canvas, and DeskPaint; or color programs like PixelPaint, Graphist Paint, and Modern Artist-how can Cricket Paint succeed?

The answer: with flying blacks and whites. Cricket Paint is polished, elegant, and intuitive. Sure, it has some new toolsvarious Spirograph-type effects, a threedimensional polygon tool (see "Neat-o Tools"). While these tools are stunning to watch, they're not always useful for day-today projects. But Cricket Paint implements the traditional painting tools (paintbrush, pencil, lasso, and so on) with an imagination and finesse that make you wish Cricket would write a word processor; this attention to the basics is what makes Cricket Paint superior.

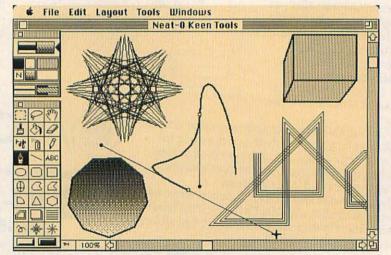
Everything Old Is New Again

The most bizarre aspect of the "innovations" in Cricket Paint is that most of them originated in other graphics programs. There's a Pen tool, for example, whose operation is lifted directly from PostScript drawing programs like Illustrator and FreeHand-but the lines it draws, of course, are bitmaps. And there is a radial shading option modeled on the sunbursttype fill patterns of Cricket Draw—but the output, of course, isn't smooth, 300-dotsper-inch (dpi) PostScript. Another feature, cribbed from Draw It Again, Sam, lets you create a library of frequently used elements of a drawing. And, in a strange, backhanded tribute to object-oriented programs like MacDraw, there is FreshPaint.

FreshPaint, implemented in roughly half of the tools in Cricket Paint's palette, must be seen to be fully understood. When you release the mouse button after drawing with one of these tools, the shape you have just created sprouts handles, precisely as it would in MacDraw. By dragging these handles, you can reshape the object, move it, or change its fill pattern or line thickness by making selections from the tool palette. Only when you click on the screen outside of the shape does the program "dry" the object into an immovable bitmap.

The advantage of this feature is that you don't need to make decisions about size, shading, and placement before you create the object; after a while, you'll find yourself slapping an object haphazardly onto the screen, secure in the knowledge that the fine-tuning can come later.

(continues)



Neat-o Tools

Some of Cricket Paint's new tools in action (clockwise from upper right): the Block tool, the Parallel Polygon tool, a nonagon made with the Hyper Polygon tool (and shaded with Radial shading), the Spiro Polygon tool, and the Pen tool (center), with its control points still visible.

THIS IS WAY BEYOND COMPUTERS.

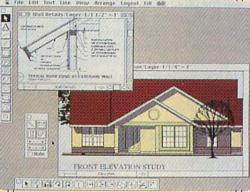


Dreams is so natural and free-flowing, it feels like this.

For years, conventional computer-aided design programs have given you powerful tools for drawing and drafting. But if you're like most design professionals, you still work by hand. Because the typical CAD program feels just like a computer.

Now, there's a whole new way to design.
Dreams." It combines serious CAD features with an elegant human interface. Which lets you think more about creating and less about computing.

We designed it with you in mind. On Apple® Macintosh® systems. It's a mid-range, multipurpose CAD program

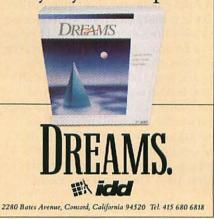


Structured drawings, details and illustrations are a snap.

that gives you MacDraft®-like drawing tools, color, layers, libraries, bezier and spline curves, advanced editing tools, PostScript® and much more. All with the most contemporary interface you've ever seen. Now

you can be more productive without spending months learning how.

We can only tell you so much here. But the more you know, the better it gets. To find out more call 415-680-6818 Ext. 400 for the dealer nearest you. Where you can discover what's way beyond computers.

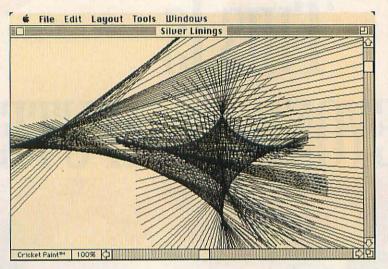


Dreams is a trademark and MacDrast is a registered trademark of Innovative Data Design, Inc. Apple and Macintosh are registered trademarks of Apple Computer, Inc. PostStript is a registered trademark of Adobe Systems, Inc.

Reviews

Line Art

This entire drawing was created in Cricket Paint with a single click-and-drag using the Background Lines tool.



QMS ColorScript

Color PostScript printer. Pros: With Post-Script typesetter (like the Linotronic), PostScript printing creates more accurate proofs of color images; installs and operates like a LaserWriter. Cons: Expensive; truncates some images because of small print area; application must support color PostScript or output will be black and white. Company: QMS. Price: Model 30, \$21,995; Model 20, \$16,995; upgrade from Model 20 to Model 30, \$5995.

You'll be convinced of the intelligence of the FreshPaint approach when you return to an older paint program, draw a rectangle, scrunch up one eye, gauge its size in relationship to the other elements of the drawing, and decide it could be a little smaller. Too late! It was frozen into position the moment you released the mouse.

Whistles and Bells

Most of the other new features in Cricket Paint are far less significant. Two of them are Spirograph pattern creators glorified versions of the original MacPaint's Brush Mirrors. They're fun to watch but of limited practical value.

Believe it or not, Cricket Paint also has a cube-drawing tool, in which the center of the screen is the vanishing point; as you drag the FreshPainted cube around on the screen, the cube changes shape to reflect the new position. This produces a rather impressive, animation-like effect, but the moment you click on the drawing and the FreshPaint dries, the object becomes just an immovable cube that you could have drawn in traditional ways.

Of all the glitzy new tools on the Cricket Paint palette, the most imaginative is the Background Lines tool. All it does is draw parallel lines extremely well: close together or far apart, thick or thin, vertical or diagonal. You can specify the thickness, pattern, and angle of the lines. Best of all, when you hold down the **k key as you drag the mouse across the screen, the lines spill and tumble, the window scrolls to make room, and the screen fills with dazzling, shooting arrays of straight lines in overlapping, interwoven moiré patterns (see "Line Art"). The actual process of

using the tool is more breathtaking than the bitmapped result. Watching the Background Lines tool at work is the best therapy you can buy on a 3½-inch disk.

Despite these flashy but slightly impractical tools, Cricket Paint wins the award for elegance. You can specify any document size up to 11 by 17 inches. You can work in any of seven resolutions, up to 300 dpi, which makes Cricket Paint a good choice for editing scanned graphics; the program reads MacPaint, TIFF, and PICT files. Cricket Paint lacks the ability to edit the spray can's shape and rate of flow, but all the other bells and whistles of current paint programs are present: you can slant, distort, and rotate shapes; edit patterns; move or hide tool palettes; trace edges; open multiple documents; split the screen to see two magnifications at once; and so forth. And, most important for the true artist, the tilde (*) key works as Undo.

Top of the Line

With the exception of FreshPaint, Cricket Paint's new features are fun but not worth paying extra for. When you get right down to it, \$199 is a lot for a program that creates only bitmaps, particularly if you already own one of its predecessors. For less money, you can buy a bitmap-and-object editor, perhaps with color support, that has less panache but more utility.

But if you are indeed looking for an easy-to-use, monochrome paint program, Cricket Paint is the best of the lot. Its manual is a model of clarity, organization, and graphic design. And to Cricket, for entering a crowded market out of simple determination to write a better program: a toast.

—David Pogue

See Where to Buy for contact information.

It's big, it's heavy, and it's expensive, but it prints in living, Post-Script color. The QMS ColorScript 100 was the first color output device for the Macintosh to support the same AppleTalk interface and PostScript page-description language as the Apple LaserWriter. The ColorScript is worth looking into for many of the same reasons that make PostScript printers a superior choice for black-and-white desktop publishing.

Except for lifting the controller and printer (together they weigh just over 110 pounds), installing the ColorScript 100 is as easy as installing a LaserWriter. You simply connect it to the AppleTalk network (the cable isn't supplied), select the standard LaserWriter driver using the Chooser, and print as you would to a LaserWriter. There are some glitches, though, that keep the conversion to color DTP from being quite as simple as it may appear at first.

What Can It Do?

The ColorScript comes with the same 35 typefaces as LaserWriter Plus and LaserWriter II. The Helvetica Narrow downloadable font is provided on disk, and all corresponding QuickDraw screen fonts are supplied as well. Unfortunately, most applications treat the ColorScript exactly like a LaserWriter, right down to rendering the image in black and white. Only applications that specifically support the color extensions to PostScript (including PixelPaint, Cricket Draw, Illustrator 88, and FreeHand) will print in color. A future release of the LaserWriter driver could remedy this problem, but at the moment even newer programs like MacDraw II won't print in color on the ColorScript.

The#1ToolKit.



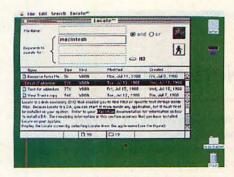
Back up your hard disk-fast.



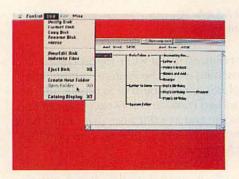
Optimize your hard disk for better performance.



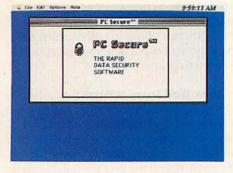
Recover a damaged disk or undelete accidentally erased files.



Locate files on your hard drive.



View and/or change folder organization.



Password protect your sensitive data.

All this for just \$79.* What's more, you don't have to be a technical genius

to use it-PC Tools/Mac is easy to use and understand.

See why hundreds of thousands of people have made PC Tools the best-selling utilities for personal computers like the Macintosh. For the dealer nearest you, or to order direct,

call (503) 690-8090 M-F, 8:00 a.m.-5:00 p.m. (West

Coast time). *Plus \$5 s/h.

Central Point Software 15220 N.W. Greenbrier Pkwy #200 Beaverton, Opengo 5090 (503) 690-809

PC Tools/Mac



Circle 357 on reader service card

The ColorScript comes in two models. Both use a 68020-based controller with 8 megabytes of memory. The model 20 prints an 81/2-by-11-inch page, while the Model 30 can print on tabloid-size (11by-17-inch) pages and includes a 20MB hard drive to hold downloaded and cached fonts. Like most other 300-dots-per-inch (dpi) color printers, the ColorScript 100 uses a thermal transfer mechanism to print in color by melting small dots of a waxbased pigment onto special paper or thermal transfer transparency film (see "Printing a Rainbow," Macworld, January 1989). The printer will output at its full 300-dpi resolution only if you restrict your output to the six additive and subtractive primary colors (red, green, blue, cvan, yellow, and magenta) and black. To simulate more colors, the ColorScript uses PostScript's halftone algorithm to print clusters of primary color dots which combine visually to form intermediate colors. However, those fullcolor images have an effective resolution of only about 60 dpi. Prints at that resolution are acceptable as proofs, or as cameraready copy in some applications that use the ColorScript's built-in color separation capability, but output generally must be restricted to primary colors.

How Well Does It Work?

Although the ColorScript's color output won't exactly match what's displayed on the screen, the fact that it's a PostScript device means that the proofs it generates will closely match the process colors you'll get if you perform your final color separations on a high-resolution PostScript output device like a Linotronic 300. QMS has



QMS ColorScript 100



This Adobe Illustrator file was printed on the ColorScript printer.

announced that it will support color matching using the Pantone system. The ColorScript will be able to render all 747 standard Pantone colors except for 13 fluorescent and metallic hues that cannot be reproduced using 4-color process printing

The ColorScript's documentation clearly discusses installation and operation procedures in both Macintosh and MS-DOS environments (the printer includes standard serial and Centronics parallel interfaces in addition to AppleTalk) and thoroughly covers QMS's implementation of PostScript and its color extensions.

The biggest single problem I found was that the image area on the ColorScript is significantly smaller than the Laser-Writer's. Unfortunately, the LaserWriter driver and, therefore, most applications don't recognize the difference and send the image exactly as if they were sending to a LaserWriter; the ColorScript then truncates the top or bottom of the image. The manual discusses ways to work around that limitation when printing small or singlepage documents, but if you attempt to print multipage images with the intention of taping them together to form a large image, you'll find that bands of your document are missing at the top and bottom of each sheet. In many cases there is no effective workaround for this problem.

Is Color Worth the Price?

If you publish in color and generate your separations electronically on a Post-Script output device, the ColorScript is a reasonable choice for a proofing device. Its ability to generate color transparencies and to produce good quality 300-dpi black-andwhite or spot-color prints make it a useful printer in its own right. Unfortunately, its incompatibility with many applications that can otherwise print in color, its lack of any screen-snapshot or colorizing utilities to help overcome those incompatibilities, its high price, and its propensity to truncate images mean that the ColorScript is far from an automatic first choice for a color printer. If your needs for PostScript color outweigh the limitations, and your budget can handle the strain, the ColorScript is a solid, reliable, and easy-to-use product. Unless you have those overriding needs, though, it might pay to wait for PostScript color output technologies to mature. -Ron Risley

See Where to Buy for contact information.

NetBridge

Bridge for creating an internet.

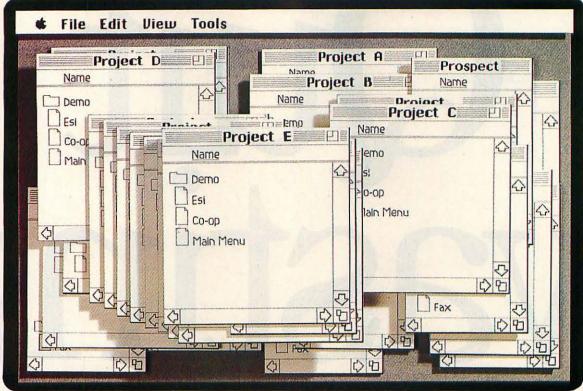
Pros: Well-designed software; assignable privileges restrict access to zones; easy to install; password protection for bridge settings. Cons: Cannot function as a half-bridge; very limited traffic diagnostics. Company: Shiva Corporation. List price: \$499. Requires: 512K.

As a LocalTalk network grows larger, traffic can seriously reduce its effectiveness. A common way of restricting network traffic is by grouping and isolating devices and users. The Shiva NetBridge is the latest network bridge to make such configurations possible and easy to set up.

Just Plug Everything In

NetBridge allows you to combine two separate LocalTalk networks into one larger internet or to split an existing network into two smaller networks to control the flow of traffic. If, for instance, your network has a small group of heavy Laser-Writer users, the NetBridge enables you to isolate them from the other members of

Are Your Files Stacked Against You?



Stack them in your favor with XTreeMac,™ The Complete Disk Management Environment.

With the Macintosh® it's so easy to organize files in folders. . .within other folders. But climbing through stacks of windows to get to the right file takes time. Opening. Closing. Resizing. Rearranging.

With XTreeMac™ you can perform your disk management tasks from a single window.

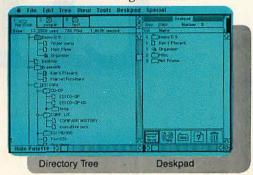
No matter where files are located — on hard disks or floppies. Disk management has never been easier.

XTreeMac's unique Directory Tree™ lets you see your disk organization at a glance.

XTreeMac's Deskpad™ provides a convenient surface for gathering files, folders and applications from multiple disks.

XTreeMac is an integrated disk management application that enhances Finder. Using familiar Finder commands, you can copy, move, rename, or delete files right on the Directory Tree or Deskpad. And you can find and launch applications directly from XTreeMac. You'll save stacks of time.

If you inadvertently delete files, don't worry. XTreeMac's Revive-A-File™ recovers them. Even after you've emptied the trash or turned off the power.





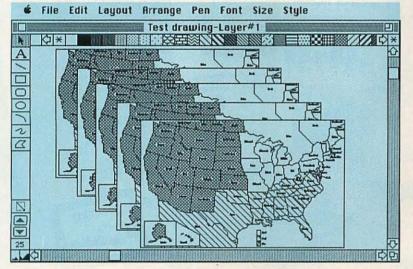
See how XTreeMac stacks up to your requirements. Contact your local dealer or call XTree Company at (805) 541-0604, (800) 634-5545 or in CA (800) 551-5353.

XTreeMac, Deskpad and Revive-A-File are trademarks of XTree Company, Macintosh and Finder are registered trademarks of Apple Computer, Inc.

MULIT Wasting IMA

ú	File Edit	Formula	Format Da	ta Options	Macro I	Window	32
170	F500 =D500+E500						
	Fill Down						Ð
	A	В	C	D	E	F	
1	Base Point	1st Quarter	Q-2 YTD	Q-3 YTD	Foreign	Total YTD	
2	11.50	23.50	35.00	58.50	93.50	152.00	
3	12.00	24.00	36.00	60.00	96.00	156.00	
4	12.50	24.50	37.00	61.50	98.50	160.00	
5	13.00	25.00	38.00	63.00	101.00	164.00	
6	13.50	25.50	39.00	64.50	103.50	168.00	
7	14.00	26.00	40.00	66.00	106.00	172.00	
8	14.50	26.50	41.00	67.50	108.50	176.00	
q	15.00	27.00	42 00	69.00	111.00	180.00	
491	256.00		524.00	792.00	1,316.00		\cdot
492	256.50	268.50	525.00	793.50	1,318.50	2,112.00	
493	257.00	269.00	526.00	795.00	1,321.00	2,116.00	
494	257.50	269.50	527.00	796.50	1,323.50	2,120.00	
495	258.00	270.00	528.00	798.00	1,326.00	2,124.00	
496	258.50	270.50	529.00	799.50	1,328.50	2,128.00	
497	259.00	271.00	530.00	801.00	1,331.00	2,132.00	
498	259.50	271.50	531.00	802.50	1,333.50	2,136.00	
499	260,00	272.00	532.00	804.00	1,336.00	2,140.00	
500	260,50	272.50	533.00	805.50	1,338.50	2,144.00	
501						MINIMALINA MILLONIN	T O
O I							中台

Excel with Excel. It takes almost 17 seconds to fill this spreadsheet on the Mac SE. Or less than 4 seconds with the Excelerator XL25 board.



Be quicker on the draw. You can draw this on the Mac SE in about 42 seconds. Or under 6 seconds with the Excelerator XL25 board.

Enough of this dillydallying.
If you're doing business with a
Mac, you're spending time you don't have
to spend.

Starting now, you can put a new fleet of power products from Irwin to work on your Mac.

And fly through all sorts of productivity tasks like never before.

If that's beginning to sound like blue sky, just take our Excelerator™XL25 board as hard and fast proof.

It drives a Mac SE up to eight full times faster.

That's right. Faster than a Mac II. Or faster than you can clap your hands.

And not just on Excel and MacDraw* II like we've shown you here.

But on data bases like FileMaker* II. Where a 1,500-record sort that takes almost 2 minutes on a Mac SE is wrapped up in less than 12 seconds with the help of the Excelerator.

On word processors like MacWrite* 5.0. Where a 46-page report is opened in less than 30 seconds instead of over 2 minutes.

And on and on. Because with an onboard math coprocessor, the Excelerator moves things even faster. Up to 100 times faster on all those number crunching jobs that make a Mac dawdle.

Or for that matter, you can access up to 8 megabytes of high speed memory. In no time at all.

And with that, we're back to our time-saving point.

The Excelerator XL25 is just one of the new MacPower™ products from Irwin. Products that include high-performance accelerators, flicker-free monitors

and no-hassle tape backups.

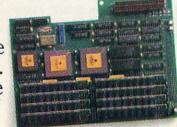
From the people who already back up more people than anybody.

Any and all of which can make you many times more productive.

To see for yourself, take a walk over to your local computer store.

Or just call 1-800-222-5871 for the name of the dealer nearest you.

So. What are you waiting for?







Reviews

the network. Since all the users remain part of one internet, the heavy printer users can still communicate with the others whenever necessary, and anyone can use the LaserWriter. But the brunt of the printer traffic is localized so that it doesn't affect all users unnecessarily. You cannot, however, use two NetBridges with modems to act as half-bridges for linking two remotely located networks, as you can two Hayes InterBridges.

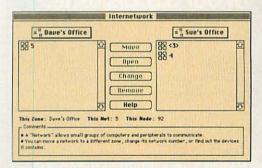
NetBridge is exceedingly simple to set up. Plug a LocalTalk connector from the first network into one NetBridge port, plug a LocalTalk connector from the second network into the other NetBridge port, plug in the power, and turn on the power switch—you're all set.

The NetBridge automatically communicates with any other bridges on the internet to determine their network number and zone. If there are no other bridges on the network, the NetBridge assigns itself a network number and assigns both its ports to the same zone.

Managing a Network

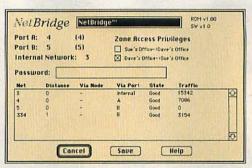
So far, you've linked together two networks using the NetBridge. If you want to create logical groups (zones) of workstations and other devices, you'll have to use the Bridge Manager software that ships with the NetBridge. Bridge Manager allows you to see all NetBridges and Hayes Inter-Bridges that are part of the internet. Then using Bridge Manager you can create zones, assign networks to zones, or redefine existing zones.

The Bridge Manager makes network configuration very easy. Its interface for



Checking the Network

The Internetwork window displayed by Bridge Manager allows you to view different parts of the internet at the same time. In this case, the zone called Dave's Office appears on the left-hand side, while another zone called Sue's Office appears on the right. Selecting a network enables the central buttons, which allow you to move networks from one zone to another or to change their configuration.



Configuring a NetBridge

Unchecking a box under Zone Access Privileges disables access between zones, in the direction indicated by the arrow. Here the upper box is unchecked, so no one in the zone called Sue's Office can communicate with devices in the zone called Dave's Office. The lowest window in the display shows all known nets. The distances given are measured in hops, that is, the number of bridges that must be traveled to reach that network.

moving networks between zones resembles that of Font/DA Mover (see "Checking the Network"). Also, to find out what devices constitute a particular network, just double-click on the network number and you see all the registered services (such as servers and workstations) that make up that network.

When you select a NetBridge's name from the list of bridges on the Internet you see the configuration for that particular bridge (see "Configuring a NetBridge"). You see the NetBridge's name, the network numbers for each of the NetBridge's two ports, and the NetBridge's routing table, which that bridge uses to communicate with other bridges on the internet. If you want to change that NetBridge's configuration, you have to enter a password. Shiva has also added a feature to its bridge called Zone Access Privileges. By assigning access privileges you can prevent members of one zone from communicating with another zone.

Although the NetBridge displays information about the traffic that has passed through the bridge, Bridge Manager does not provide any diagnostic information, like that provided by the Hayes InterBridge software. Information such as the number of bad *packets* (a block of data for data transmission), packets with net number conflicts, and the number of packets routed can prove useful in diagnosing network problems and in determining how a

network should be reconfigured with another bridge.

At the moment, Shiva only provides files for working with the NetBridge and the Hayes InterBridge. As other bridges become available, the company intends to make the required files available to NetBridge owners.

Expand Your Network, Locally

The Shiva NetBridge is an ideal bridge for connecting two networks or splitting a network to isolate busy users. The bridge is simple to set up, and zone configuration is a snap with Bridge Manager. At \$499, the NetBridge is a bargain when compared with the \$799 price of the Hayes Inter-Bridge. If you're really interested in linking two networks via half-bridges and high-speed modems, however, you'll have to pass on the NetBridge and choose the Hayes InterBridge instead. —Dave Kosiur

See Where to Buy for contact information.

Microsoft Works 2.0

Integrated productivity software. Pros: Easy to learn and use; unique integration of several powerful tools. Cons: Slow with large files; buggy first release. Company: Microsoft Corporation. List price: \$295. Requires: 1MB.



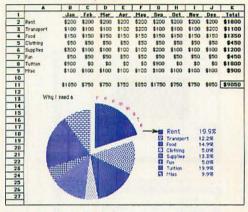
Since its introducton in late 1986, Microsoft Works has hovered near the top of the Macintosh software

hit parade with good reason. Combining the most important productivity tools in a low-cost package, it is an ideal program for users who are new to the Mac and those who prefer simplicity over power. Like most integrated software packages, Works includes a word processor, a spreadsheet with charting capabilities, a file manager that performs basic database functions, and a telecommunications module. But version 2.0 adds powerful new drawing tools and other features that put it in a class by itself.

Color Works

Probably the most striking addition to Works is color. Choosing a color for a section of text, a part of a drawing, or a print-





Drawing Conclusions

This pie chart was generated from spreadsbeet data, pasted into the spreadsbeet document, and edited and embellished using the new drawing tools. The word roommate was stretched along a curve using the Spread Text command.

out is no more difficult than choosing a font: simply select one from the menu of eight possibilities. But until color monitors and printers become more common, this feature probably won't excite the typical Works user, who has a Mac Plus or SE.

Most Works users aren't likely to be affected by the added support for the Apple Extended Keyboard either. But they'll certainly notice the switch to hierarchical menus, which replace many of the previous version's dialog boxes with time-saving pop-up submenus.

Another potential time-saver is the macro option, which records the tasks you perform. There's no way to edit a macro, though, so you can't tell it what to do if conditions don't match the ones under which it was recorded. If your macro for connecting to CompuServe encounters a busy signal, for instance, it just keeps typing, oblivious to the fact that nobody's listening.

One Works feature that still needs improvement is the primitive method of creating page headers and footers. Typing "&LWorks&RPage &P", for instance, prints a justified, numbered header at the top of each page. Fortunately, a new Print Preview option allows you to peek at the results before you commit to paper.

Word Works

The word processor is a practical, no-frills word machine. When used with the database, it can easily print multiple-column mailing labels, personalized form letters, and custom forms.

A built-in version of the Spellswell spell-checker, with a 60,000-word custom-

izable dictionary, has also been added. It's easy to use, relatively intelligent, and compatible with other Spellswell dictionaries.

Works' word processor won't satisfy everybody. Some users will want more keyboard shortcuts and automatic footnoting, hyphenation, and outlining.

Art Works

Still, Works has something few highend word processors offer: a built-in, full-featured drawing program. Rather than having to import pictures created and edited with other applications, you can now create drawings on the spot or modify imported object-oriented drawings. And since the drawings exist on a separate, transparent layer of a document, you can first place the graphics and then arrange text around them to suit your publishing needs.

The drawing module also includes a tool that places blocks of text on the drawing layer itself. Since text blocks can be linked, it's possible to create multiple-column documents this way. Unfortunately, you are limited to one justification style per block, and beginners may find it confusing to place text on two different layers. Most users will find text blocks useful for short sidebars or captions, but inadequate for long documents.

Data Works

The drawing tools are available in the Works spreadsheet module, too. You have always been able to produce quantitative charts from spreadsheet data in Works; but in version 2.0, you can paste these charts into a spreadsheet (or a word processing document) and customize them with different patterns, colors, text, and styles from the drawing toolbox. Pies can be expanded, bars stretched, legends edited, flourishes added—all within Works. With these graphics tools and the new font- and style-control options, you can customize a document in ways that few other spreadsheet applications allow.

Another impressive new feature enables you to attach pop-up notes to individual cells. These notes can remain simple on-screen reminders, or you can have them print as footnotes. The spreadsheet module also boasts a larger capacity (256 columns by 16,382 rows) and new date/ time functions.

Changes in the database module are less significant. This basic file manager now allows you to change the font and size of text in database documents, accepts date/time functions, and allows a little more flexibility in the creation of reports.

The Whole Works

The individual pieces of Works are impressive in their own right, but their real strength is in their integration. The Works user interface is, for the most part, intuitive and easy to learn. And the Works environment enables you to open a variety of document windows, MultiFinder-style, on a basic 1-megabyte Mac. Information can be easily and quickly passed back and forth between windows in almost any combination.

Although Works slows down considerably when you approach your machine's memory limits, it admirably performs the tasks that occupy most Macintosh users most of the time.

The manuals are complete and clear, both for learning and for reference. If you include the help file in the same folder as the application, you're never far from onscreen documentation. For new users, there's a HyperCard tutorial that introduces the most important features of Works in an interactive format.

I found a few worrisome bugs in version 2.0. There were sporadic system crashes when I tried to save documents and occasional problems with the screen display after particularly heavy editing. It is also impossible to pour text and graphics directly into PageMaker as you could with Works 1.0 because PageMaker does not directly support the Works 2.0 file format. You can save your work as text-only and place it in PageMaker, but of course, you lose all formatting, and you have to leave the graphics behind. For Works owners with Word 3.02 there is the option of saving files first in RTF format, which keeps the formatting; importing the RTF files into Word; and then placing the text into Page-Maker, since it does directly support the Word format. However, the point is that you can no longer easily use Works 2.0 with PageMaker. Bugs notwithstanding, Works 2.0 is an impressive package and a bargain to boot. It's an ideal first software purchase for new Mac owners; many will never outgrow it. - George Beekman (with research by Eric Johnson)

See Where to Buy for contact information.

Systat. The only professional statistics package on the Mac.

If you are serious about statistics, there is only one choice. Mac reviewers have named it:

"Systat, the best statistics program on the market . . ."

MacWeek

"... for scientific and commercial use the Systat-Mac combination is the top choice..." Macworld

"SYSTAT currently represents the high end of Macintosh stat software..." MacWeek

Version 3.2 now offers more graphics than any Mac or mainframe package, plus a new full-featured data editor.



Available for Macintosh Plus, SE and II. Single copy price: \$595. Site licenses, quantity prices available. Call or write for further information.

Systat Inc., 1800 Sherman Avenue Evanston, IL 60201 312 864.5670 Graphics Overlay plots PostScript support for LaserWriter Export pict files Two dimensional: Error Bars Scatterplots Line and Vector Graphs Vector, Dot, Bubble and Quantile Plots Bar Graphs (single, multiple, stacked, range) Box plots (single and grouped) Stem-and-leaf diagrams Linear, quadratic, step, spline, polynomial, LOWESS, exponential smoothing Confidence Intervals and ellipsoids (any alpha value) Smooth mathematical functions Rectangular or polar coordinates Log and power scales ANOVA interaction plots Histograms (regular, cumulative, fuzzy) Stripe and jitter plots Gaussian histogram smoothing Scatterplot matrices Voronoi Tesselations Minimum spanning tree Maps with geographic projections (U.S.

tree Maps with geographic projections (U.S. state boundary file included) Chernoff faces
Star pilots Fourier plots Pie charts
Contour plots on regularly and irregularly spaced points Control charts and limits

Three dimensional: Data plots Smooth function plots Vector plots Linear, quadratic, spline, least squares surface smoothing Three-dimensional type fonts.

Statistics Basic statistics, frequencies, ttests, post-hoc tests Multiway crosstabs with log-linear modeling, association coefficients, PRE statistics, asymptotic standard errors

Nonparametric statistics (sign, Runs, Wilcoxon, Kruskal-Wallis, Friedman two-way ANOVA, Mann-Whitney U, Kolmogorov-Smirnov, Lilliefors, Kendall coefficient of concordance) Pairwise/listwise missing value correlation, SSCP, covariance, Spearman, Gamma, Kendall Tau, Euclidean distances Linear, polynomial, multiple, stepwise, weighted regression with extended diagnostics. Multivariate general linear model

weighted regression with extended diagnostics Multivariate general linear model includes multi-way ANOVA, ANOCOVA, MANOVA, repeated measures, canonical correlation Principal components, rotations, components scores Multidimensional scaling Multiple and canonical discriminant analysis, Bayesian classification Cluster analysis (hierarchical, single, average, complete, median, centroid linkage, k-means, cases, variables) Time series (smoothers, seasonal and nonseasonal ARIMA, ACF, PACF, CCF, transformations, Fourier analysis)

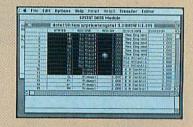
Nonlinear estimation (nonlinear regression,

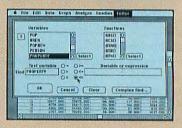
Data Management Spreadsheet data editor with row/column cut and paste Transformations executed via menus and dialog boxes Import/export test files Missing data, arrays, character variables Character, numeric, and nested sorts Subgroup processing with SELECT and BY Value lables and RECODE statements Unlimited cases.

maximum likelihood estimation, and more).

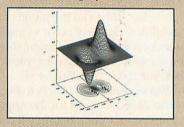
Macintosh Plus, SE, II and LaserWriter are registered trademarks of Apple Computer, Inc.; PostScript is a trademark of Adobe Systems, Inc.

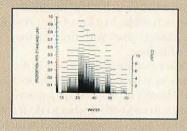
Mac screens



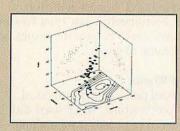


LaserWriter™ graphics









Dealers circle 492 on reader service card End users circle 491 on reader service card

StarDrive 60TX

SCSI 60MB tape drive with StarTape 3.0.

Pros: Quiet, efficient, easy to use. Cons: Nonstandard tape format; limited single-user and network options. Company: Ruby Systems. List price: \$990 (includes terminators, interface, power cables, and two blank cassette tapes; with User Group discount \$697). Requires: 512KE; SCSI port.

Ruby Systems' StarDrive 60TX is an efficient, low-cost tape backup drive. As long as you have no need to read from or write to Apple-standard drives or do extensive network backups, the StarDrive is quiet, fast, and easy to use.

Desktop Quiet

Installation is as simple as plugging in the cables, adjusting the SCSI port setting with a click of a switch, and copying the StarTape program onto your hard disk. The drive is so quiet when idling that it's difficult to tell whether or not it is on. Even when the tape is streaming, the sound level is barely above that of an audiotape rewinding.

I tested the 60TX on a nonnetworked Mac Plus with a DataFrame XP 20 hard disk, and on a Mac II with 2 megabytes of memory and a 40MB Apple hard disk on a version 2.01 AppleShare network with two Giga Cell DataFile 150 tape drives as servers. In both cases I was using System 6.0.1, Finder 6.0.2, and MultiFinder 6.0.1.

StarTape

The StarTape software offers complete, select, or incremental backup. The complete, or mirror image, backup runs at nearly 4MB per minute; the select and incremental backups, at almost 2MB per minute. By comparison, the fastest floppybased backup programs (PC Tools and FastBack) barely crack 1MB per minute, not counting the time it takes to insert all those floppy disks.

It is easy to create a temporary or scripted backup set and know immediately how much data and exactly which files you are backing up (see "File-by-File Selection"). Optional passwords for individual tapes or backup sets write-protect the tape but you don't need to use them in order to restore a crashed disk.



StarDrive 60TX

The StarDrive 60TX is designed to fit comfortably underneath a Mac Plus, an SE, or under the Mac II monitor:

Not Really Made for Networks

It's best to use a Ruby StarDrive 60TX with a Mac Plus or SE since it rests comfortably under either one. Under a Mac II monitor, however, the shielding in both components may not be adequate to ensure separation of their respective electromag-

Ruby supports the 60TX running under TOPS, but at press time the company had not yet tested it under AppleShare. I did. The 60TX was inconsistent in its ability to find all the files on the server that I selected for backup. The 60TX also crashed when running AppleShare with Multi-Finder on a 2MB machine because it ran out of memory.

Although LocalTalk's painfully slow data-transfer rate is primarily to blame, the 60TX took nearly ten minutes to read through 80MB of data on the server to select files for backup, and then almost one minute per megabyte for the actual backup. While not as laborious as backing up a

Select files to backup: □ Quinta do BomFim □ Apps Quinta do Comm. Folder Eject DiskFit 🗆 Empty Folder Drive □ Filemaker Backup Hypercard Issue-April Help □ Issue-Feb ☐ Issue-January Cancel AII Load 0 files 0 bytes Saue Files modifed after: Select 12/5/88 12:06:19 PM

File-by-File Selection

StarTape automatically selects files modified after a specified date and time, and by selecting folders and files you can define and save backup sets to speed up your regular backup sessions.

single-user system with floppies, this process is just as time-consuming. In addition, StarTape cannot do a mirror-image backup or back up multiple volumes in one session over a network.

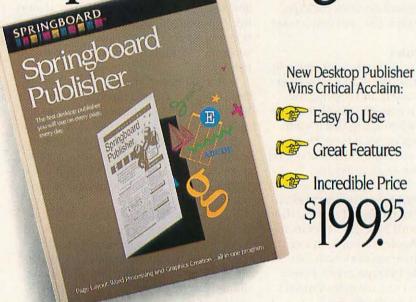
Reliable Performance, No Frills

This product is a solid, no-frills performer. I sorely missed, however, the option to cancel a backup once it had begun. Although somewhat lacking in overall technical information and missing an index, the documentation is well organized for general use with step-by-step, easy-tofollow procedures, suggested backup strategies, and precautionary advice. The Teac CT-500 or CT-600 cassettes that the unit requires were difficult to find at local computer supply houses, but they can be ordered directly from Ruby Systems for \$20 to \$25 each. And the drive's QIC-36 format does not read or write from the QIC-100 format that Apple has tried to establish as a standard for tape backup devices.

I was assured by the consistently friendly, helpful people at the other end of the toll-free support line that the next release of StarTape will include the ability to overwrite existing files instead of having to write the backup data to a separate folder. As it stands now, tapes cannot be overwritten, only appended. Ruby Systems has quite wisely erred on the side of overprotecting its user base. The company's assumption is that the Restore function is reserved for those occasions when something has gone wrong with your hard disk and you have to reformat it. In the best of all possible worlds, you will never have to use Restore. If the worst happens, however, the 60TX offers efficiency, ease of use, and all the basic functions required of a singleuser backup system.—Nancy Canning

See Where to Buy for contact information.

Hello, Springboard Publisher. Good-bye, word processing.



Springboard Publisher™ makes desktop publishing so easy, you'll choose it over word processing for just about everything you do, every day.



Page Layout

Word Processin

Graphics Creation

Springboard Publisher" gives you the best features of MacWrite. MacPaint" and PageMaker"—all in one program.

New Springboard Publisher™ puts page layout, word processing and graphics creation at your fingertips. All in one program.

So you can "click" your way from layout to text to graphics without ever leaving your page. Or juggling between programs.

It's all so simple. So affordable. So much more fun than plain of word processing.

And most important, Springboard Publisher

helps you communicate more effectively, persuasively and dramatically. Every day. In practically everything you do.

Call for your Demo Disk* to preview Springboard
Publisher as well as six other new

Publisher as well as six other ne

Say "hello" to Springboard
Publisher. And you'll soon have just one
word for word processing.
"Good-bye."

Call for Demo Disk 1-800-445-4780, Ext. 4020 \$5 charge (VISA/MC) refundable with purchase.



Springboard Software, Inc. • 7808 Creekridge Circle • Minneapolis. MN 55435

^{*}HyperCard required. Springboard and Springboard Publisher are trademarks of Springboard Software, Inc. HyperCard is a registered trademark of Apple Computer, Inc. MacWrite and MacPaint are registered trademarks of Claris Corporation. PageMaker is a registered trademark of Aldus Corporation. © 1989 Springboard Software, Inc.

Gofer 1.0

Text-finding DA. Pros: Searches files of many different types; fast; searches in the background; bas excellent search criteria. Cons: Large for a desk accessory; not always successful in filtering out extraneous characters. Company: Microlytics. List price: \$79.95. Requires: 512KE.

Gofer is a desk accessory that searches quickly through the files on a hard disk, looking for the text that you want, looking in the files where you want it to look, and putting what it finds on the screen or in a text file.

This Gofer Isn't Vermin

Unlike its furry namesake, vou'll be happy to have this Gofer around. To start a search, you need to tell the program three things: what to search for, where to look for it, and how to process the results. You can choose from three kinds of search. The Simple search, which is the default choice, finds just the text you type (or paste) into the text entry box. For a more refined search, clicking the And, Or, Not, Nearby button makes several new text boxes and radio buttons appear (see "What Do You Want?"). You can then type in additional text choices to narrow down the search, using Boolean logic. For example, say you have several membership lists from various organizations and each list also has a brief description of that organization's goals. You want to find out which organizations John or Mary Smith belongs to, but you don't want to include any religious affiliations. A Boolean search for these criteria would look like this: John Smith OR Mary Smith NOT religion OR church. The final type of

search is a Browse. When Browsing, you don't need to tell the program to find anything specific; it makes every file available for copying.

You tell Gofer which folders to search by selecting the Where button. A file selection window appears that lists files and folders by category, size, kind, and modification date. Clicking on a category name sorts the list by that category. You can choose files or folders from the list, including or excluding them using the usual click-Shift-click-and-drag technique or the Select All button. With the extremely flexible Where options you can search everything, search only certain kinds of files, search everything except certain kinds of files, skip applications and read only documents, and even tell Gofer to look only in files or folders that contain a particular name or part of a name. Gofer remembers these settings, so you need to customize your search pattern just once.

The last step is to tell the program what to do with what it finds. The How dialog box lets you tell Gofer to show each find in the main Gofer window, or write the finds to a text file. Gofer tags found text with the name of the file it was found in and the path to that file, and Gofer includes a user-specified number of lines before and after the found text, for context.

It's Fast, It's Easy

The whole process takes a lot less time to do than to explain; in operation Gofer is fast and almost effortless to use. It found 49 instances of the word *Macworld*, searching through 597 files taking up more than 9 megabytes, in just over six minutes. Once Gofer completes its search, it displays the first find in the last file searched (see "Tracking Down Text"). You can select and copy to the Clipboard any or all of the

What: Simple ® RND, DR, NOT, NERRBY Browse

What: Simple ® RND, DR, NOT, NERRBY Browse

When matworld or expo

OF EMPO

What Do You Want?

In this test, Gofer finds files that contain the text macworld and expo or expos and San Francisco. You don't have to capitalize the text you enter for the search.

file displayed, and the program allows you to add to the contents of the Clipboard with the Copy More command. This is a great feature; it lets you stay in Gofer, building up the Clipboard with text that you want. You can then paste it all into an application, avoiding the need to copy, switch to the application, paste, and switch back to Gofer for more text. You can also do a simple find for a text string within one of the found files by using the SubSearch command.

The program can search in the background, whether or not you're running MultiFinder. The search slows down considerably while in background mode, but you can still continue to work while Gofer is searching behind the scenes.

Rough Spots

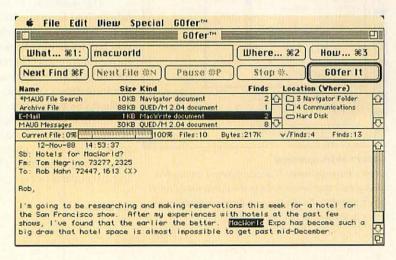
Gofer does have some problems. Built into the program are several text filters, which screen out extraneous formatting characters from searched files. The version of Gofer I reviewed did not have adequate filters for FullWrite Professional or Word Perfect files, so the results of a search in these documents were frequently full of garbage characters. Microlytics will provide a free update for registered owners on request.

Gofer is a DA that quickly makes itself indispensable. It does most of the functions of specialized text-retrieval programs that cost many times more, and it's fast and easy to use. It will quickly earn a place on your Apple menu.—*Tom Negrino*

See Where to Buy for contact information.

Tracking Down Text

The main Gofer window shows the results of a search. The bottom part of the screen contains the found text, which you can select and copy to the Clipboard.



MGMStation 2.5

Computer-aided design and drafting package. Pros: Color display and output; precise control over dimensions, scaling, and text placement; can cut, copy, and paste within MGMStation windows and between other applications; offers true layering. Cons: Limited macros; no 3-D capabilities; nonstandard Macintosh interface. Company: Micro CAD/CAM. List price: \$999 (2.5 I, monocbrome); \$1399 (2.5 II, color). Requires: 1MB for monocbrome; 1MB with Mac II for color.



Computer-aided design and drafting (CADD) packages can vastly improve productivity by making

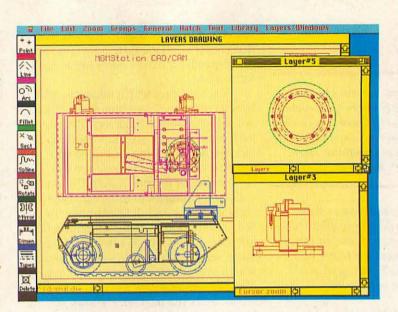
short work of repetitive drawing tasks, eliminating hand calculations, and significantly reducing editing time. But to realize these gains, the software must provide quick access to hundreds of sophisticated functions. That's one of the many benefits that MGMStation provides.

Recent improvements to Micro CAD/CAM's package make a top performer much stronger (see "Benchmark: Mechanical CAD," *Macworld*, November 1987). The most significant changes include a substantial increase in speed, true layering, expanded options for keyboard entry, and multiple windows. These enhancements help MGMStation outdistance other highend systems—such as AutoCAD on the IBM PC and the Mac version of Versa-CAD—in most drawing tasks.

Precision Drafting

MGMStation is one of the few CAD packages that uses 16-place floating-point calculations—a requirement for tight-tolerance machined parts. Then there's its raw speed. MGMStation 2.5 for the Mac II works almost twice as fast as the previous version, 2.09. Zooming from full view to 10:1 magnification, for example, is eight times faster than with VersaCAD: Versa-CAD took 16 seconds and MGMStation, 2 seconds.

The user interface is a departure from the Macintosh norm. Selecting one of the ten toolbox icons on the left of the screen, for example, reveals a menu of specific commands for drawing lines or arcs. A



Layers and Windows

MGMStation supports an unlimited number of layers and windows. The contents of any layer are easily displayed in a new window.

function stays active until you escape by sliding the cursor into the side menu area, a feature that speeds up repetitive drawing.

The standard Macintosh menu bar is often replaced by data entry or dialog boxes. Once a command is executed, the standard menu bar automatically returns—resulting in maximum design space.

With approximately 200 functions, MGMStation 2.5 gives you the tools and flexibility to handle most mechanical design tasks. First, you define the drawing size according to ANSI or ISO standards, or enter a custom paper size. Scaling is automatically adjusted according to English or metric units.

Next, you specify points freehand, by typing absolute or polar coordinates, or by placing a point on a custom gridwork. You

CAYES BRAWING

LAYES BRAWING

HOUSTLA OR DAD/COM

Relian

Relian

OLISE

Briefly

Br

Layers Management

Layers management is accomplished through a dialog box that lets you view the contents of each layer graphically. An icon indicates whether the layer is Shown, Active, or Hidden.

draw lines to points you've determined, or have MGMStation calculate a spot on existing lines and arcs.

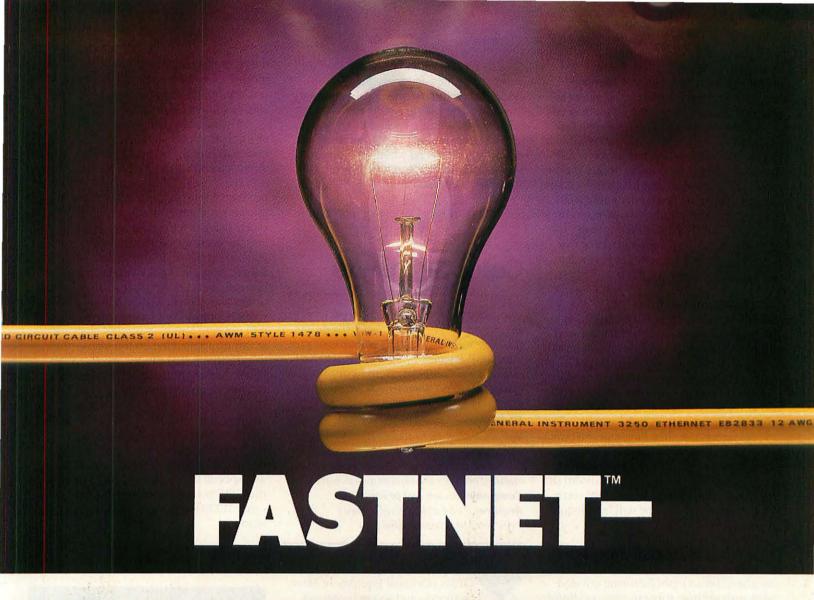
Then you use the Contour Offset command to duplicate the pattern at a specified distance from the original, which is valuable for indicating the width of a drill or other tool during machining.

MGMStation also includes options for drafting circles and arcs, and for placing dimensions. For example, Fillets rounds all corners of an entity. The program is also especially adept at executing mirroring, splines, chamfering, tangent lines, and arcs—all in a variety of line colors, widths, and patterns.

Creating cross-hatching as fills is extremely easy in MGMStation. You just click on the shape to be shaded and specify the pattern. Hatching lines can be rotated to any angle, their thickness or pattern changed, and their color varied.

Enhanced Editing

The addition of cut/copy/paste capabilities and layering eliminates MGMStation's few serious limitations. Previously, you had to group elements to duplicate or move them—and then ungroup sections for editing. Now, you can quickly select a drawing area, copy it to the Clipboard, and paste it elsewhere into the same drawing or another window. Moreover, you can scale the Clipboard with accuracy, which makes it simple to insert drawings into other programs. And when parts of a drawing are copied or pasted, you can effort-



THE LINK THAT THINKS

FastNet's intelligent Ethernet™ communications products put a network computer right on your Mac's desktop. For-

- network bridges
- network gateways
- terminal emulation
- shared peripherals
- high processor overhead activities

... FastNet thinks about it so you don't have to.

With their own 68000 microprocessors, FastNet intelligent communications products think about the future, too. FastNet II, FastNet AE, and

FastNet SCSI offer you a platform from which you may expand your capabilities and develop new ones.

If you don't need the additional processing power that intelligent FastNet products provide, Dove also has several Macintosh™ Ethernet adapter solutions in the FastNet family. They support all types of full function networking applications and today's most popular protocols.

Dove Computer Corporation offers more Ethernet solutions for your Macintosh than anyone. Think FastNet. Call us toll free 1-800-622-7627.



high performance ether-networking products from



1200 N. 23rd Street/Wilmington, NC 28405 919-763-7918 FastNet is a registered trademark of Dove Computer Corporation. Ethernet is a trademark of Xero: Corporation, Macintosh is a registered trademark of Apple Computer, Inc.

Circle 173 on reader service card

Reviews

lessly eliminate lines or whole sections by clicking on the extraneous elements.

The way MGMStation implements layering is especially impressive. Not only can you view layer names within a dialog box -and rearrange them in any order—but a graphic of the layer appears as you scroll. No more guessing at what attributes are assigned to a particular layer. As a layer is selected it can be inserted into a new window, a valuable feature if you use common parts or formats in different drawings. As with groups, you can make a layer active, view-only, or invisible. There's no limit to the number of layers available.

Finishing Touches

MGMStation's text editor has been modified substantially. You can place text in a table, balloon, frame, or on a pedestal complete with a line to a selected point; as you move the text, the indicator line will continue pointing to the selected item. You can also import larger text blocks from a word processor or the Clipboard.

Using a BASIC-like language, MGMStation now incorporates macros. The coding recognizes menu and icon selections and prompts for user input through custom dialog boxes. Although they still need some refinement, these macros will be adequate for most tasks.

Closing the Manufacturing Loop

Not surprisingly, MGMStation can be integrated into a manufacturing environment with milling, turning, and punching modules. What's unusual is that MGMStation rivals minicomputer CAM and some mainframe CAM applications. These optional modules let you create CNC (Computer Numeric Control) programs directly from drawings and simulate results before committing the piece to manufacture.

MGMStation also integrates well with other applications. An optional translator lets you move drawings between IGES, DXF, or PICT formats, Several large firms use this feature to send MGMStation drawings to mainframe systems and to other microcomputer CAD programs including PC AutoCAD. Additionally, a number of good symbol libraries are available from Compu-Arch in Beverly Hills, California.

MGMStation shows a maturity that stems from earlier implementations on the Lisa. Simplified editing reduces reliance on the somewhat cumbersome group commands. Enhanced text capabilities, more

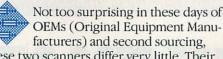
options for placing dimensioned text, and improved plotter drivers (which are included) contribute to precise, high-quality drawings. The layering and windowing implementations are excellent. About the only item missing is 3-D, not a significant shortcoming when you consider MGMStation's price and file-transfer ability. -Mike Heck

See Where to Buy for contact information.

Color Scanners

Sharp JX-450 Color Scanner. Pros: Versatile, programmable, high-resolution (up to 300 dpi) color scanner; variety of options; good results. Cons: Bundled software inadequate for extensive use. Company: Sharp Electronics. List price: \$6995. Requires: Hard disk; 4MB of memory (5MB to 8MB recommended).

Scanmaster. Pros: Versatile, programmable, bigh-resolution (up to 300 dpi) color scanner; variety of options; good results. Cons: Documentation not thorough or well organized; bundled software inadequate for extensive use. Company: Howtek. List price: \$8195. Requires: Hard disk; 4MB of memory (5MB to 8MB recommended).



facturers) and second sourcing, these two scanners differ very little. Their hardware and National Semiconductor interface boards are identical. Even their accompanying software—except for the

Identical Hardware

scanning programs—is the same.

As seems to be the case with most color-based hardware, the Sharp and Howtek Color Scanners are a bit larger (22 inches wide by 21 inches long by 7 inches high) and heavier (roughly 55 pounds) than the current crop of black-and-white scanners. The Scanmaster and the Sharp JX-450 are moving-bed scanners: the scanning lamp is fixed, and the top part of the scanner moves up to 8 inches in both directions when scanning. Keep that in mind when you decide where to install one.

The scanners, designed to be completely controlled by a Macintosh, have no controls other than an on/off switch. However—in a welcome departure from many of the black-and-white scanners—they do have a series of green LED indicators on

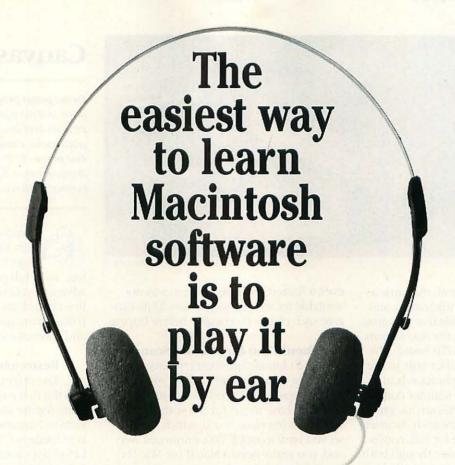
the front. These indicate readiness, scan mode (color, halftone, black and white), fast scanning, and resolution (300, 200, 150, 100, or 75 dots per inch).

The scanners themselves are a hacker's delight; they can be controlled with commands in the form of character strings that you send via the Mac. Scanning resolution is user selectable, from 30 to 300 dots per inch (dpi), with fractional resolutions allowed. A number of predefined scan sizes (such as legal, letter, and A4) are available, and the corresponding placement is marked on the scanning surface. And, of course, you can define your own scan size. You can also choose other scanning settings (scan rate, gradation, zoom, data correction, output data format). Average users will not care about any of this, since the scanning application on the Mac is preset.

Both the Scanmaster and the Sharp JX-450 use an IEEE-488 (GPIB) bus interface to communicate with the computer. Because of that, you can hook them up to any computer with an IEEE-488 interface port or board. Both companies offer the National Semiconductor GPIB board for use of either scanner with a Mac II, as well as a special version for the Mac SE. With the GPIB you can hook up a number of other IEEE-488 devices in addition to a scanner.



Scanned Image The image displayed in LaserPaint was captured as a 24-bit TIFF file using ChromaScan and the Howtek Scanmaster flatbed scanner.



The fastest way to learn software is to have an expert sit beside you and talk you through the program, step by step. With your hands on the keyboard, trying each new skill as it's explained, learning is a snap.

So Personal Training Systems gives you that expert—on an audio cassette. Each 90-minute tutorial contains the cassette, example files on a disk, and a quick reference card. It's like having your own private tutor . . . only this one works anytime, anywhere, and doesn't charge by the hour.

In addition to training on the Macintosh itself, tutorials are available for Microsoft Excel, Word and Works; Aldus PageMaker and Persuasion; Adobe Illustrator 88; and HyperCard. Since we offer beginning, intermediate and advanced levels for each software program, there's sure to be one that meets your needs.

All our tutorials are unconditionally guaranteed. You'll learn how to use your Mac or favorite software program—without opening a book or attending a class—or your money back.

So if you're looking for a fast, convenient, affordable way to learn, contact Personal Training Systems by calling 1-800-TEACH-99, or mail in the coupon below. Because the more you listen, the more

you'll learn.

Personal Training Systems®



Circle 42 on reader service card

Name —		
Company	V	
Street		this single time
City	State of the state	State
Zip	Davtime P	hone

Little Difference The Howtek Scanmaster (left) and the Sharp JX-450 Color Scanner (right) use identical National Semiconductor interface boards.



MARK IOHANN

Both scanners come with the same assortment of diagnostic, configuration, and driver programs. An INIT file that you drop into the System Folder lets the Mac system and programs talk to the GPIB board. The two software collections differ only in the general color scanning application bundled with each. The Sharp scanner comes with a program called PixelScan that greatly resembles Howtek's MacScan-It. Neither program is really adequate for full, convenient use of the color scanner, though both offer many special options (especially Mac-

Imagenesis's ChromaScan program will enable you to exploit these color scanners. Designed to work with the Sharp scanner, it also works perfectly well with the Howtek. And while it lacks some of the specialized features of the bundled software, it works more reliably. The other two packages have problems saving files, are prone to crash at inopportune moments, and don't run unless the interface board is in the machine. ChromaScan, on the other hand, works even if the scanner isn't hooked up to a board in the machine. Its user interface (although a bit awkward) works a lot better than those found in Mac-Scan-It or PixelScan. If you purchase either scanner, you should definitely buy Chroma-Scan as well.

All three packages offer various possibilities. You can scan images of various sizes, at various resolutions, and in a number of formats (black and white, gray scale, color). All three claim to support a Raster-Ops mode that lets you do a true 24-bitsper-pixel scan for display using the Raster-Ops 24-bit video board for the Mac II. However, a RasterOps-based system was not available for testing, so you should investigate such claims thoroughly before buying.

Should You Buy a Color Scanner?

The ultimate question remains: should you buy a color scanner at all? If you decide to, be prepared to spend a lot of money. First, you have to pay for the scanner itself and for its interface board, which should set you back a cool \$7000, minimum. Second, you really need a Mac II (or Mac IIx) to get full use of a color scanner; if you use a Mac SE, you're better off getting a blackand-white scanner. Third, you're going to need at least 4MB to 5MB of memory and possibly more, depending upon the size and resolution of the images being scanned. Finally, you really need a large color monitor if you're going to scan anything but small pictures at low resolutions.

Given the expense involved, it's not clear what would justify the purchase of a color scanner. In larger institutional settings, a single scanner might be handy for scanning in color artwork to be used on the computer. Color separation—producing separate color scans of an image for printing purposes—is often cited as a reason to buy a scanner, but you're probably better off using regular color separation equipment.

In a few years, when prices have dropped and color laser printers are more widely used, color scanners will have broader application; for now, their uses are limited to specialized professional tasks. If you need one, though, consider the Sharp or the Howtek scanner . . . and be sure to pick up a copy of ChromaScan if you get either one. —Bruce Webster

See Where to Buy for contact information.

Canvas 2.0

Draw/paint program. Pros: Full-featured draw and paint program plus color-blending facilities and layers. Cons: Doesn't print color separations. Company: Deneba Software. List price: \$299.95. Requires: 1MB; two 800K floppy drives or bard disk; System 6.0 or later version. 2MB recommended.



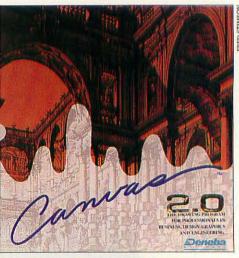
Canvas 2.0 offers multilayering, fully manipulatable text blocks, object libraries, autodimension-

ing, and a full palette of colors. It also has advanced painting facilities, bezier curve line control, an autotrace tool, and a color palette manager with sophisticated blend and contrast controls—all for about \$300.

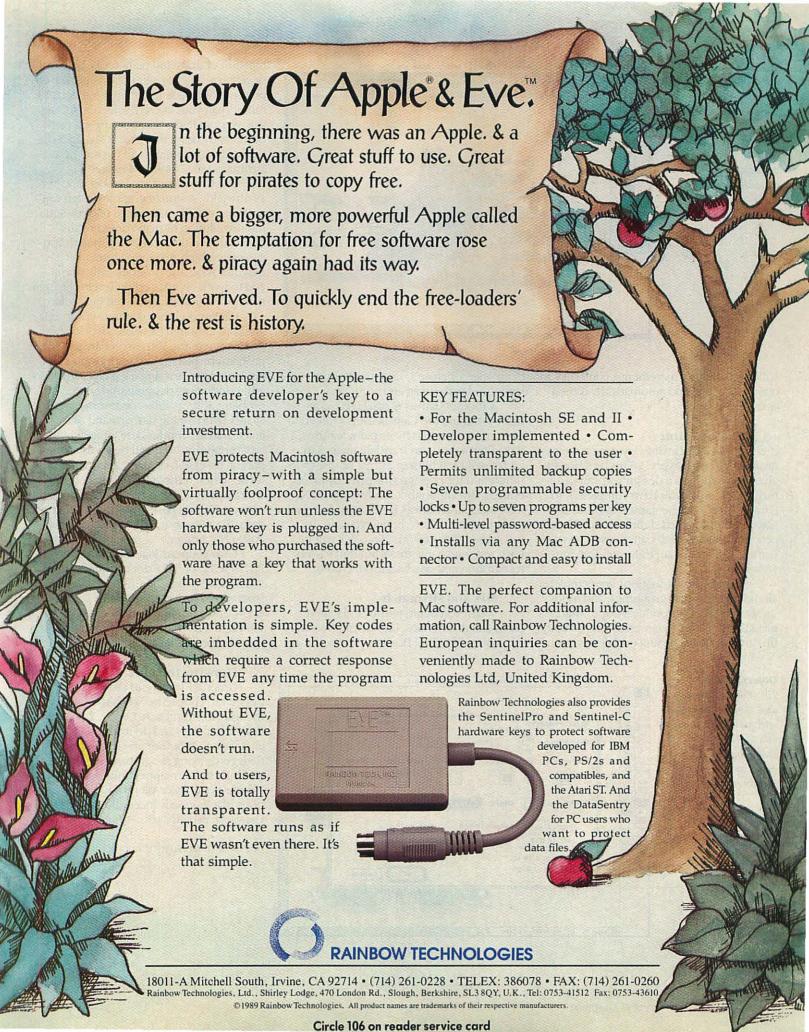
Restretching the Canvas

The original Canvas (and Canvas DA) was the first paint/draw-combination program for the Macintosh. It translated objects to bitmaps, transformed low-resolution bitmaps (72 dpi) to high-resolution (2540 dpi), rotated text and graphics in 1-degree intervals, and zoomed into or away from an image in 32 levels. With up to a 9-by-9-foot work surface, it was large enough to design a billboard.

Today's Canvas smooths polygons, aligns objects to 1/64,000 inch, and transforms images from bitmaps to objects or vice versa. But Canvas hasn't just been restretched; you can now address 256 colors and gray



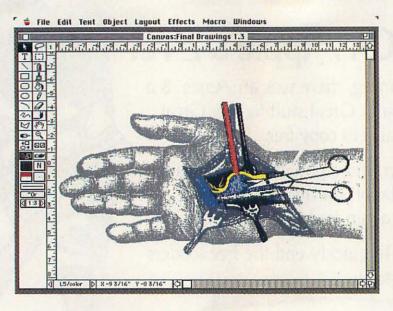
Canvas 2.0 from Deneba Software



Reviews

Layers

The final overlay of a six-image series showing a complicated surgical procedure. Each layer was copied and pasted into Video-Works for the final animated presentation.



scales in 1-degree increments, construct an object in layers, and automatically dimension lines and arcs.

Draw or Paint?

Canvas 2.0's flexible layering system is invaluable (see "Layers"). This function enables you to add to a design without disturbing the work you have completed. In Canvas, layers can be named, moved, activated, or hidden, and dimmed (to a 50 percent gray) or colored. Canvas even lets you name, save, and recall different drawing views.

Canvas's draw functions are complete; all the object types, groupings, and modifications (open, smooth, reshape, align, group, and so forth) as well as the standard fills are available. Adding or deleting points to an open or closed, smoothed or unsmoothed path is fast and accurate.

Although Canvas is marketed as a draw program, the Canvas users I talked to were most intrigued by its paint features. With Canvas you can translate images into high-resolution bitmap format or one of 15 different dither options for pixel-by-pixel editing. But although it is more advanced than MacPaint, Canvas is not a full-featured paint program. Even though you can use a full standard or custom 256-color palette, each separate paint area is limited to one foreground and one background color.

Mix and Mismatch

When you begin to mix and match paint and draw zones, Canvas can become confusing. The Tool Box is a cluttered combination of draw and paint tools. Line, color, pattern, and transfer options portrayed on the tool palette reflect general defaults, rather than your current selections. One way you can make changes to a selected object is by using the Object Manager dialog box, which reflects all current object attributes (see "Object Manager").

The Canvas surface can become just as unwieldy. A simple graphic design can quickly turn into a montage of draw and multiresolution bitmap zones. It's disconcerting to discover that although you can view a high-resolution bitmap at any magnification, the program only permits you to work on it at certain levels of magnification (which are displayed in boldface).

Canvas does not generate color separations, although Deneba is working on a color separator. You can get around the problem by placing separations on different layers and printing each layer individually. Printing overlapping objects can be a problem. Canvas relies on transfer modes to mix overlapping bitmaps and draw objects. Transfer modes determine whether an overlapping area will be opaque, transparent, reversed, or any combination of these. When translated to PostScript, each overlapping object is printed as an opaque entity. A Canvas PostScript option lets you see a file the way it will be printed on a PostScript printer.

Canvas opens MacPaint, MacDraw, PICT/PICT2, or TIFF documents and supports pastes from the Clipboard. It also allows you to save documents or specific layers within a document as MacPaint, PICT/ PICT2, or TIFF files and to print only a selected object or layer.

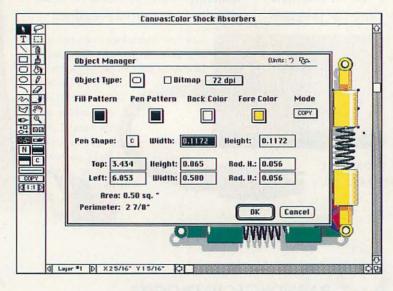
Drawing the Line

Graphics styles and tastes vary, and it's difficult to choose between the bitmap or the drawing approach. Canvas 2.0 lets you draw both ways and do it with flair as well as accuracy. Whether you require a fullfledged drawing program, need to modify an imported bitmapped image, or want to dabble in the color-blend and bezier options of a more advanced illustrator's tool, Canvas may be for you.—Joost Romeu

See Where to Buy for contact information.

Object Manager

The Object Manager dialog box reflects the selected object's attributes and lets you make changes to the object as well as change its resolution.



Pop Ouiz. Stop. This is a test. For the next 60 seconds, we will be conducting a quiz about Macintosh®II Videographics. Do not turn the page until you have looked at the visual clue and answered all the questions.

Which Macintosh II graphics card offers the widest range of capture and display resolutions-NTSC, PAL, Apple® Monitor, hi-res, interlaced, noninterlaced and other modes?

a) NuVista 2M b) NuVista 4M c) All of the above

Name the only videographics card which provides true-color, real-time capture and broadcast-quality display while occupying only a single slot in a Macintosh II.

a) NuVista 2M b) NuVista 4M c) All of the above

Which videographics card offers full QuickDraw™ compatibility at 1,2,4,8,16 or 32-bits per pixel?

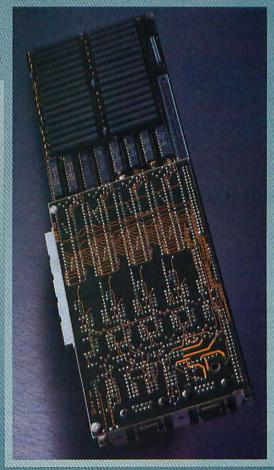
a) NuVista 2M b) NuVista 4M c) All of the above

Visual clue for Videographics test.

If you chose (c) on all three questions, congratulations! You know that the NuVista series from Truevision is the answer to all your advanced videographics needs. The NuVista is available with either 2Megabytes or 4Megabytes of video memory, and creates professional video effects and computer graphics using any QuickDraw compatible software, now and in the future. No patches, no gimmicks, no hassles.

So whether your application is video production, digital prepress, presentation graphics or 3D renderings, you'll find the NuVista will pass your test with flying colors. Oh, and if you answered (a) or (b) to any question above, give yourself half credit. Then obtain even more NuVista information by requesting a copy of our educational brochure True color? True answers. or visiting your local Authorized Truevision Reseller. Either way, you can find all the answers with a NuVista. Call us at 800-858-TRUE.

You may now return to your regular reading.





INATIONAL: Canada 416/499-9400 France 33-13-952-6253 Italy 39-2-242-4551 Switzerland 41-1-825-0949 U.K. 44-1-991-0121

HARD DRIVES









Three great names, one low price!

The BIGGEST name in low priced hard drives comes to MACINTOSH.™

HARD DRIVES International . . .

- Our Multi-Million Dollar buying power assures the lowest possible prices.
- Friendly, knowledgeable sales staff will help you choose the drives you need.
- Factory-trained technicians in our Technical Department can assist you with trouble-free installation and setup of your hard drive.
- Helpful Customer Service Representatives provide service after the sale.
- All products include a One Year Warranty and our 30-day "Worry-Free" Guarantee.

INTERNAL KITS FOR SE & II

20Mb MiniScribe	68ms	\$355
30Mb Seagate	40ms	\$411
45Mb MiniScribe	28ms	\$499
80Mb Quantum	19ms	\$875

INTERNAL KITS FOR MAC II ONLY

65Mb Seagate	40ms	\$ 529	
160Mb MiniScribe	17ms	\$1222	
340Mb MiniScribe	16ms	\$1955	

These complete internal drive kits include the drive, UniMac™ formatting & partitioning software, hardware mounting kit, all necessary cabling, and How-To manual.

EXTERNAL DRIVES FOR MACINTOSH PLUS, SE & II

20Mb MiniScribe	68ms	\$ 426
30Mb Seagate	40ms	\$ 479
45Mb MiniScribe	28ms	\$ 569
60Mb Seagate	40ms	\$ 589
80Mb Seagate	28ms	\$ 799
80Mb Quantum	19ms	\$ 955
160Mb MiniScribe	17ms	\$1275
340Mb MiniScribe	16ms	\$2075

External drives include drive, UniMac™ external case, power supply, cabling, formatting & partitioning software.







1912 W. 4th Street Tempe, Arizona 85281 (602) 967-7435 FAX: (602) 829-9193

1-800-234-DISK

International Orders: (602) 967-7435

Phone Orders: 7am — 7pm Mon. — Fri. 10am — 4pm Sat. (MST)

Customer Service: 1-800-234-5197 TELEX: 405765



VISA

Never A Surcharge For MC and Visa

Price and availability subject to change. All items are new with manufacturer's warranty. 5% surcharge for American Express and COD orders, PO's accepted 2% 10 days, NET 20, subject to 9% surcharge. 30-day Gastrantee conditions: shipping & handling charges not retundable; product must be in original condition. Add 420 shipping to rOverseas Military APO-FPO EXPRESS Delivery. Hard Drives International is a division of Insight Distribution Network, Inc. MACINTCH is a registered trademary of Apple Computers, Inc.

MCW 0389



If for any reason, you are not completely satisfied with any product, simply return it for a prompt and courteous refund!

QuarkStyle 1.0

Designer templates for desktop publishers.

Pros: Contains a variety of distinctive template designs; short learning curve; combines pagelayout tools with word processing features.

Cons: Manuals lack necessary information on font installation and on bow to unlock Style templates in QuarkXpress; not compatible with low-end laser printers. Company: Quark.

List price: \$295. Requires: 1MB; LaserWriter Plus and bard disk recommended.

QuarkStyle 1.0, a package of 71

templates from the makers of QuarkXpress, is an accessory for both experienced and novice desktop publishers. Created by eight prominent designers, it targets the corporate user, providing outlines for business reports. memos, business cards, stationery and letterheads, newsletters, party invitations, brochures, a book design, and even a sample notice to issue stock certificates. At first glance, QuarkStyle looks like Xpress; the same menus and tools appear on screen. The box interface is also the same—you must draw a text or graphic box on the page to define an active area before you can type, draw lines, or import a graphic image. The similarity ends here, however, because the tool to create high-quality typography is no longer in the menu—it is in the templates themselves.

Although QuarkStyle works independent of Xpress, it combines many of Xpress's basic page-layout features, such as the ability to import and resize text and graphics, alter columns, and draw lines and boxes; it also has search-and-replace word processing features, a spelling checker, and an extensive hyphenation dictionary. By providing designer templates, QuarkStyle lets you bypass the complex typographical setup required by Xpress and puts you right to work in the format you want.

But Does It Work?

QuarkStyle attempts to blend design creativity with meeting the needs of the average Mac user. The compromise is to allow two options for every template—one created in an uncommon, or "designer," font, such as Bodoni or New Baskerville,

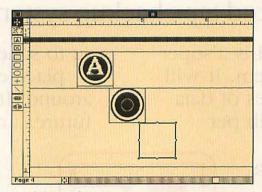
and another version in the resident Laser-Writer Plus font. Because I did not have the designer fonts installed in my system, however, all I could see were jagged, bit-mapped versions of type in the templates. The only way that I was able to visualize the advanced designs was to refer to the printed examples in the manual. Also, it would have been helpful if some explanation of designer fonts had been included in the manuals.

The software works in conjunction with a PostScript printer and Adobe laser fonts only. Quark does not guarantee template reproduction with the bitmapped fonts of low-end laser printers using Quick-Draw routines. In fact, all of the designs



Customizing a Design

The 17 letters of my own name will not fit in the box when I try to customize this letterhead design. To fix it, I have two choices. I can change the font to a smaller point size, but that will throw off the overall halance of the design. Instead, I can unlock the box containing my name and enlarge its overall size.



Find the Right Box

This graphic element is the centerpiece of another letterhead template. To substitute the first letter of your last name, you need to activate the box containing the letter rather than the background. Since it's in reverse video (white type on a black background), this graphic is composed of three layers of boxes.

make use of the LaserWriter Plus, which has 11 resident typefaces, such as Avant Garde, Palatino, and Zapf Dingbats. If you have a standard LaserWriter with only four fonts (Courier, Helvetica, Symbol, and Times), you will have to purchase additional fonts to make full use of the templates.

Replacing Text

When you open a template, a page of dummy type stands out, showing you exactly what the intended line or paragraph should look like. You can see numerous graphic flourishes, such as small bold capital letters at the beginning of a sentence, throughout the template. This method allows you to work with intricate designs. On the other hand, I found it disconcerting to type over existing text. You can import text, of course, but it makes more sense to do that in the longer report or newsletter templates than in the business cards or letter stationery. It was also a painstaking task to replace the text in some of the more complex designs. What looks so simple and elegant on the page is actually several layers of active boxes clustered together. You must activate the correct box before you can retype.

Replacing graphics is a straightforward task. QuarkStyle lets you import TIFF and PICT graphic images. Many of the designs block out an area in gray for an image. Two of the templates come with their own graphics, which can be deleted.

A key feature is the ability to lock or unlock a box. A template may contain from 1 to 40 boxes, and each box is locked. A little padlock icon appears when you try to move or resize the box. You can unlock the boxes one at a time through the Item menu, but you cannot unlock the bottommost layer of master boxes. Unlocking the other boxes allows you to alter bits and pieces within the design, but you can't revamp the layout. For example, if you want to change a dropped capital letter in the beginning of a newsletter article, you can type in the new letter and then unlock the box it resides in. Once you resize this box, the surrounding text will reflow around the box and improve the text wrap. The only way to unlock a master box is to import the template into Xpress. In Xpress you can unlock and even create new templates.

(continues)

Backing Up for the Future.



Fast, reliable and convenient, the PCPC JETSTREAM is the most advanced tape backup system available today.

The PCPC JETSTREAM is a super high performance system. It will archive over 2 gigabytes of data at speeds up to 14.4 Mb per minute. You can now

minute. You can now back up multiple drives onto a single, low cost 8 mm video tape cartridge.

The JETSTREAM allows

you to schedule backups to take place even when you're not around. It's the backup for the future...and it's available today.

> Call PCPC at 1-800-622-2888 or 1-813-884-3092 for more information and the name of your nearest dealer.

Personal Computer Peripherals Corporation

To Buy or Not to Buy

QuarkStyle templates can eliminate the tedious work of producing common forms such as purchase orders, business cards, and letterheads. Working with both programs enables you to build specialorder templates for your clients. There are also plans in the works to develop templates for different business fields, such as real estate and legal work. These improvements could make template packages even more popular than typesetting software.

QuarkStyle brings sophisticated designer templates that improve on the current crop of Helvetica clones to the beginning desktop publisher. But before QuarkStyle can stand on its own as an "instant publishing" program, Quark needs to focus more on the needs of beginners. -Barbara Tannenbaum

See Where to Buy for contact information.

Stepping Out II

Large-screen display without a large screen monitor. Pros: Gives you the effect of a larger monitor without the expense. Cons: Can conflict with INITs in your System Folder. Company: Berkeley System Design. List price: \$95. Requires: 1MB.

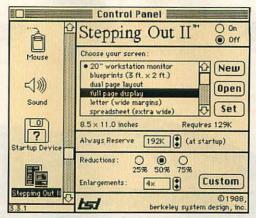


I've never gotten over the rush I experienced the first time I used a full-page display. But unfortunately, not many of us can afford one. Berkeley System Design, once again, offers an inexpensive solution: Stepping Out II.

While the first version forced you to reboot to turn off the computer and reconfigure the screen, Stepping Out II is a CDEV (Control Panel device) that enables you to change screen size on the fly.

What's a Virtual Screen?

Stepping Out II creates a virtual screen of any size up to 116 inches wide and 65 inches tall on your Macintosh Plus, SE, or II. How can you have a 116-by-65inch monitor when your physical screen is only 9 inches? The larger screen is displayed in memory; the small screen quickly pans the large screen as it follows the cursor.



Stepping Out

The Stepping Out CDEV appears in the Control Panel window. The scrolling window lists the available predefined monitors. The size and memory requirements for the selected screen appear below the window.

You can choose your monitor size from one of the seven preset screens: 20inch workstation monitor, blueprints (3 feet by 2 feet), dual-page layout, full-page display, letter (wide margins), worksheet (extra wide), or standard Mac II monitor; or you can set your own. The New button opens a screen definition dialog box that allows you to set the size of your screen by dragging the handle of the screen-size box.

Whenever you select a screen size, its pixel dimensions and the RAM required are displayed. If you have sufficient memory, you can change screens automatically; otherwise you have to restart. An Always Reserve (at startup) selector lets you reserve the memory you need for a larger screen at the time you start up.

If you don't want to run Stepping Out in certain applications, the QuickStart feature lets you reserve the memory you need for a screen so you can turn off Stepping Out. Then as you launch the program you want to use with Stepping Out, you hold down the Option key to invoke it. The only drawback to QuickStart is that it doesn't work with MultiFinder.

Zooming In and Out

The magnifying glass is one of Stepping Out's best features. You can set the amount of enlargement and reduction from the Control Panel, and you can automatically zoom in or out, while working on a word processing document, the same way you change views in PageMaker. You can also magnify the area around the cursor from 2 to 16 times.

Several new features help you use a small screen to look at a large window. The

Custom dialog box gives you many options. For example, you can have the screen follow the insertion point. If you are typing and your document extends beyond the edge of the screen, the screen pans to stay with the insertion point. And you can have the screen follow the active window. You can also lock the view, useful if you want to work on an area of your drawing or document and not have to worry about the screen panning when you get near the edge. If you open a dialog box while you are working, the screen moves to the box. Or you can also have the menu bar stay at the top of the screen (not pan with the screen) so that no matter where you are in a document, the menu commands are within reach. The size of the menu area can be adjusted, for example, so that the formula bar in Excel or the pattern palette in SuperPaint will always be available.

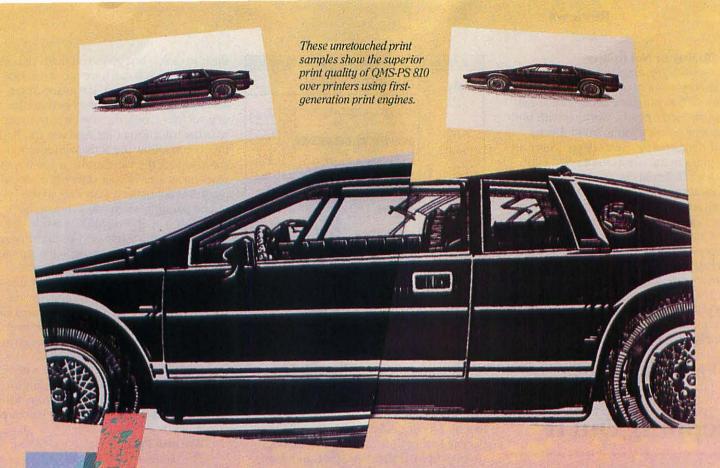
Stepping Out II is compatible with MultiFinder and works with some large monitors for the Plus and SE. It works with the Macintosh II and supports 24-bit color.

War and Peace?

The battles that INITs and CDEVs sometimes rage in your System Folder can be annoying. Because Stepping Out II is a CDEV and installs itself at start-up in alphabetical order along with the INITs, you can have problems. Fortunately, Stepping Out is compatible with most programs. Even though the Stepping Out manual warns that it isn't compatible with some menu clocks and screen blankers, the program worked well with Itty Bitty's AutoBlack 1.5 (shareware), Fifth Generation's Pyro 1.5, and Steve Christensen's new SuperClock 2.9 (freeware) CDEV.

Because a large virtual screen requires additional memory, Berkeley System Design does not recommend that you use Stepping Out II with a Macintosh 512KE. The company has upgraded the original Stepping Out to be compatible with System 4.1/Finder 5.5 or later, and recommends that 512K and 512KE owners use that System. Stepping Out II works well within 1-megabyte limitations as long as you remember that color uses two to eight times more memory than black and white. If you cannot afford a larger screen, then Stepping Out II may be an affordable answer. —Fred Terry

See Where to Buy for contact information.



ntroducing the PostScript laser printer that blacks out at high speeds.

The QMS-PS* 810 can compose and print the most complex pages in record times, with richer, more saturated blacks than ever before. All with the desktop publishing power of Adobe PostScript*, and the superior print know-how of QMS, an industry leader.

"...the

has to be

OMS PS-810

rated as one

of the best

buys in the

competitive

PostScript

@1988 Laser Connection.

printer field."

-Publish!

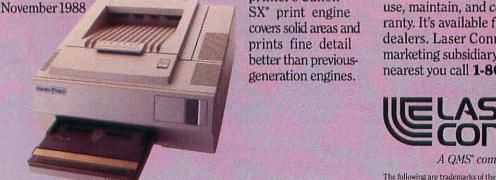
Under the hood QMS ASAP™ (Advanced System Architecture for PostScript) is proprietary technology that helps eliminate the hardware bottlenecks that hinder other PostScript printers. As a result, QMS-PS 810 boasts processing speeds remarkably faster than other PostScript printers in its class. And faster output means greater productivity. In addition, the QMS-PS 810 laser

> printer's Canon* SX* print engine prints fine detail generation engines.

Fast start, strong finish You can adorn your documents with one or all of the 35 Adobe typefaces. Thanks to PostScript, there's an infinite number of font variations available. You can also make type as large or as small as you want. And put it anywhere on the page. In fact, with PostScript you enjoy total control over the design of your page. It gives you the complete desktop publishing power to do things that would otherwise be virtually impossible. So you get high-quality output exactly how you want it.

Along with PostScript, the HP LaserJet+™ Diablo* 630 and HP-GL™ printer emulations are added for your non-PostScript software.

The QMS-PS 810 laser printer is easy to use, maintain, and comes with a one-year warranty. It's available from Laser Connection dealers. Laser Connection is a sales and marketing subsidiary of QMS. For the dealer nearest you call 1-800-523-2696.





A QMS" company

The following are trademarks of their respective companies: QMS, QMS-PS, ASAP, Laser Connection of QMS, Inc. PostScript of Adobe Systems, Inc. Canon, Canon SX of Canon, U.S.A. LaserJet +, HP-GL of Hewlett-Packard. Diablo of Xerox Corp.

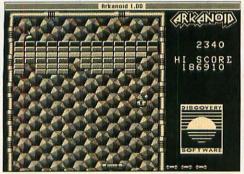
Circle 104 on reader service card

Arkanoid 1.0

Arcade-type game. Pros: Fast, smooth, responsive action; challenging, exciting play. Cons: Distracting background patterns; skimpy documentation; must boot from System on Arkanoid's 800K disk. Company: Discovery Software International. List price: \$49.95. Requires: 512KE.

Someday science will give a name to the curious state of consciousness that video games can induce. It's a mix of meditative calm and hyperalertness. Maybe it's because play in general tends to re-create a feeling of childlike energy. Or maybe there's just something about staring at the screen looking at little bouncing things...

Arkanoid, based on a coin-op arcade classic originally created by Japan's videogame giant Taito, is definitely one of those calming/energizing games. Discovery has ported Arkanoid smoothly and expertly to the Mac—and so faithfully that it prompts you, at game's end, "To continue game, insert additional coins or click your mouse button before the timer reaches 0." As in an arcade game, the action is as smooth and responsive as can be. It's the best I have experienced on the Macintosh; there is none of the irritating understeer of a Lode Runner or a Maze Wars, or the hard-to-master bounciness of a Crystal Ouest. You move the mouse, and the vaus moves with it.



Round One

The vaus is at the bottom of the screen; the ball appears just above and to the right of the falling E capsule. A Konerd sits atop the formation of bricks (at left). The three small vauses at lower right indicate that the player has three lives remaining.



What's a Vaus?

The vaus is the paddle. Arkanoid is a classic brick-and-paddle game like the old Breakout. You move the paddle back and forth across the bottom of the screen to hit a bouncing ball that breaks apart a formation of bricks. When you break through the brick barrier and get the ball up on the top of the bricks it careens around, quickly destroying several bricks before bouncing back down to the vaus. It's also possible (with much practice) to put English on the ball and aim it through gaps in the bricks.

When you've cleared the screen of bricks, you move to the next level and a new, more difficult, arrangement of bricks. Various types of bricks have different point values and different characteristics: one kind is indestructible, one kind releases power capsules, and there are many others.

If you can catch a power capsule (without having it distract you into missing the ball), the vaus acquires new powers. Each capsule has a letter on its side that stands for a power; for instance, *L*, for laser, turns the vaus into a formidable brickblasting gun; *E*, for extend, elongates the vaus; *D*, for door, warps you into the next level.

Other assorted entities fall into the area of play. Some look like the walking molecules from the simulation program Life, and some are mean little geometrical shapes. These characters have names like

Whirling Konerds, Opopos, and Pyradoks; they are not mentioned in the manual, but on the back of Arkanoid's box it says you must "dodge and destroy [them] or be destroyed!" I found in play, however, after carefully avoiding these critters for several dozen games, that they're quite harmless.

When you start, you can pick from four difficulty levels, choose whether to play a one-player or a two-player game, and select how many lives you want. A unique feature of the game is the minimal speed mode (which is toggled on and off with the *T* key), created especially for people with disabilities that affect reflexes or dexterity. Like an arcade game, Arkanoid includes a high-score table (but you must start by clicking on the Arkanoid High Score icon, rather than on the ordinary Arkanoid icon, if you want your high scores saved).

A Few Minor Problems

Arkanoid's eight-page manual lacks detail and information. It contains a comicbook story about the game's setting and two pages of quotes on "The Arkanoid Phenomenon." Only one page is devoted to instructions for playing the game on the Mac. However, if you pause the game and select About Arkanoid under the menu-bar Apple, you'll find a series of help screens that tell about scoring, key commands, strategies, and so on. The game is easy to figure out, and you could get along without a manual altogether—undocumented features are a fine old tradition in video games.

A more serious problem is the eyestrain factor. It's very hard to follow the ball against some of the complex backgrounds, and it's also difficult to distinguish among the various types of brick. Every Mac Arkanoid player I spoke with complained about the jazzy, distracting backgrounds. I played three color versions of Arkanoid—the Amiga version, the Nintendo version, and the original coin-op arcade game—and both the backgrounds and the bricks are easier to see in color. Discovery Software expects to release a color version for the Mac II in 1989.

But those flaws are minor; Arkanoid is a first-rate game. Considering how quickly you can become addicted to it, it's a good thing you don't really have to insert additional coins.—Felicity O'Meara

See Where to Buy for contact information.

				Workst	ieet1 🚟	
	A	В	C	D	E	f
1	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
2	\$56.00	\$6,584.00	\$65.00	\$56.00	\$8.00	\$98,416.00
3	\$51,651.00	\$65.00	\$465.00	\$6,512.00	\$65.00	\$61.00
4	\$651.00	PRESENTATION OF PROPERTY AND PROPERTY AND PERSONS.	\$321.00	\$6.00	Accompany of the party of the p	\$6,265.00
5	\$9,684.00	\$654.00	\$6.00	\$651.00	\$6.00	\$636.00
6	\$6,565.00	MANAGER PROCESS AND SERVICE PROCESS OF STREET	\$23.00	\$6.00	A ADMINISTRATOR PRODUCED COLUMN TO A PROPERTY OF A STATE OF THE STATE	\$6,548.00
7	\$5.00	************************************	\$505.00	\$85,146.00	\$1.00	\$1,00
8	\$6,00	\$2.00	\$23.00	\$321.00	\$321.00	\$6,941.00
9	\$654.00	and the state of t	\$5,643.00	Character with the party of the design of the second	\$5.00	\$65.00
10	\$6.00	\$1.00	\$595.00	, \$6.00	\$63.00	\$846.00
11	\$8,984.00	*****************	\$2,059.00	\$1.00	\$51.00	\$51.00
12	\$65.00	fazia krainki a kantanti in transferationi di kantanti na mai	\$35.0	654.00	\$635.00	\$9.00
13	\$65.00	\$1,549.00	17.00	\$65.00	\$158.00	\$51.00
14	\$356.00	\$5.00	\$3,512.00	\$1.00	\$1.00	\$9.00
15	\$654.00	CARAMACANA CARAMACANA CANA CANA CANA CANA CANA CANA CA	692.00	\$651.00	\$54.00	\$59.00
12	1 409,00	\$6,549.00	\$,635.00	\$5,618.00	\$65.00	\$8.00
	.00	\$25.00	\$92.00	\$654.00	\$50,196.00	\$651.00
	00.	\$1.00	\$5.00	151,00	\$516.00	\$98.00
	.00	\$6,000			\$51.00	\$51.00
	1.00	\$85.7		A Company	\$6,985.00	\$8.00

Make your Mac larger than life.

Attach your Macintosh to our 6448C+2 Ultimate
Presentation System™(UPS) and place it on any standard
overhead projector. Suddenly you've got an interactive Mac
display that scales up to even the largest audiences.

Or download your display information into the UPS's megabyte of memory and take it virtually anywhere. (Lifetime batteries included.)

- High resolution monochrome projection (640x480 pixels)
- Heat tolerant to 65° C (149° F) no fan
- One megabyte of memory
- Page scroll/windowing/special effects generator
- · Compatible with the entire Apple Macintosh family

Fully compatible with: Macintosh™ 128K, Macintosh 512K, Macintosh Plus, Macintosh 512Ke, Macintosh SE (video adapter required), and the Macintosh II (with video card).

So put your Mac
in the big time today.
For more information
on the UPS or the name
of your closest dealer,
phone today — 800-327-7231
Ext. 401

IN FOCUS SYSTEMS INC.™

7649 Southwest Mohawk St. · Tualatin, Oregon 97062 · 503-692-4968

Dealer Inquiries Invited.

Trademarks/owner: Macintosh/Apple Computer, Inc.

Perfectstudy 2.01

Study aid and test generator. Pros: Improves study skills; relatively inexpensive. Cons: User interface is sometimes awkward; editing can be time-consuming. Company: Powerware Systems. List price: \$39. Requires: 512K.

What Evelyn Wood does for dynamic reading, Powerware's study organizer may do for exam preparation. Perfectstudy is a learning aid designed to improve the memory retention and study skills of high school and college students. It claims to increase studying speed by a factor of three, guarantees 100 percent recall of all study materials entered into the system, and promises that grade point averages will improve for all those using the Perfectstudy technique.

Utilizing Perfectstudy's impressive test-generating feature, instructors can produce multiple-choice quizzes quickly by having the program automatically supply wrong answers for each question. It's even possible to create different versions of a single test from the same data file, since the application randomly selects the data used to generate exam questions.

While Perfectstudy will probably help students make better use of their study time (by helping them organize lecture notes and reading matter), and will probably improve a student's ability to answer questions quickly and accurately, you should be skeptical about Perfectstudy's claims for up to a 60 percent reduction in study time and error-free recall. The current version does not offer a procedure for measuring either increased study rate or reduced study time.

How Does It Work?

Perfectstudy improves memorization skills by teaching students to associate key

phrases with definitions. Students create study files for individual textbook chapters and lectures. Each file entry consists of a key phrase (up to 50 characters) and a definition (up to 3 lines). As a precaution, the program automatically saves to disk after every fifth entry. Every Perfectstudy file must contain a minimum of 8 key phrases. The process of extracting key phrases and their definitions is a learning task in itself, forcing students to pay attention to the subject matter.

You create a new study file by incorporating the key phrases and definitions from two or more individual files for a cumulative study effect. With a linked file you can study several chapters or lectures. You can use Append File to add key phrases and definitions to an existing file, or use Revise File to make word changes or spelling corrections.

After you load a study file, the program is automatically in Phase 1. Perfect-study presents a single underlined key phrase at the top of the screen (the question) and five randomly selected definitions below (the answers). If the correct answer is selected, a new key phrase appears with its possible answers. Students must answer each question correctly on the first try in order to move on to Phase 2.

Incorrect responses prompt the program to give the correct answer, include the wrong answer as a choice whenever the question is repeated, immediately ask the missed question again, and repeat the question four times at the end of the file.

Phase 2 reverses the study direction by offering a single definition as the question and five key phrases for answers. Phase 3 presents questions that alternate between Phase 1 and Phase 2 formats.

When used to create exams, Perfectstudy randomly selects the test format. Each quiz includes both key phrase and definition questions. The Print Test option generates a question for every key phrase in the file. To print a specified number of

questions, you must rename and append the file, adding or deleting the required number of key phrases.

Printed tests have a coded number on every quiz and answer key; this comes in handy when there are multiple tests for the same class. Printed tests can include a space for the student's name and social security number, as well as the date.

ImageWriter LQ owners must copy the printer driver into the program's System folder and access Chooser under the Apple menu to select it. Otherwise the program will not print to an ImageWriter LQ.

Perfectstudy Is Not Perfect

One of the program's major weaknesses is that it only partially adheres to the Macintosh user interface. For example, say you click on Create and then decide to exit before writing the minimum eight keyphrase definitions. There is no cancel button option; you can exit only by restarting.

When you enter a key phrase, the cursor becomes a flashing vertical line. Unfortunately, even this line disappears when you write the definition, making it difficult to ascertain the cursor's actual position on the screen (see "Creating a Study File"). You can edit by pointing and clicking the mouse anywhere on the definition. You must press the Backspace (or delete) key (the arrow keys don't work) to erase everything up to the point of the error. Editing thus becomes a time-consuming process.

These annoyances are relatively minor—you can learn to cope with an occasional reboot or the absence of a flashing cursor. Version 2.0, however, had a serious bug that deleted files when the renaming function was canceled. Version 2.01 eliminates this problem. Contact Powerware for a free upgrade if you have the earlier version.

The Power to Do Your Best

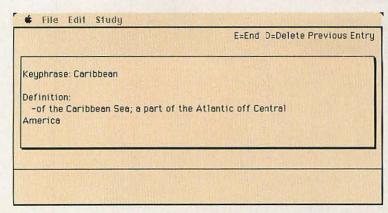
Perfectstudy does not motivate students to study faster and retain more, but it does offer a study method for learning quickly and efficiently. Students can take advantage of the program's exercises to increase fact retention and can use the key phrase/definition technique to improve memory skills and test scores. All in all, Perfectstudy is a valuable learning aid, and its test-generating function is terrific.

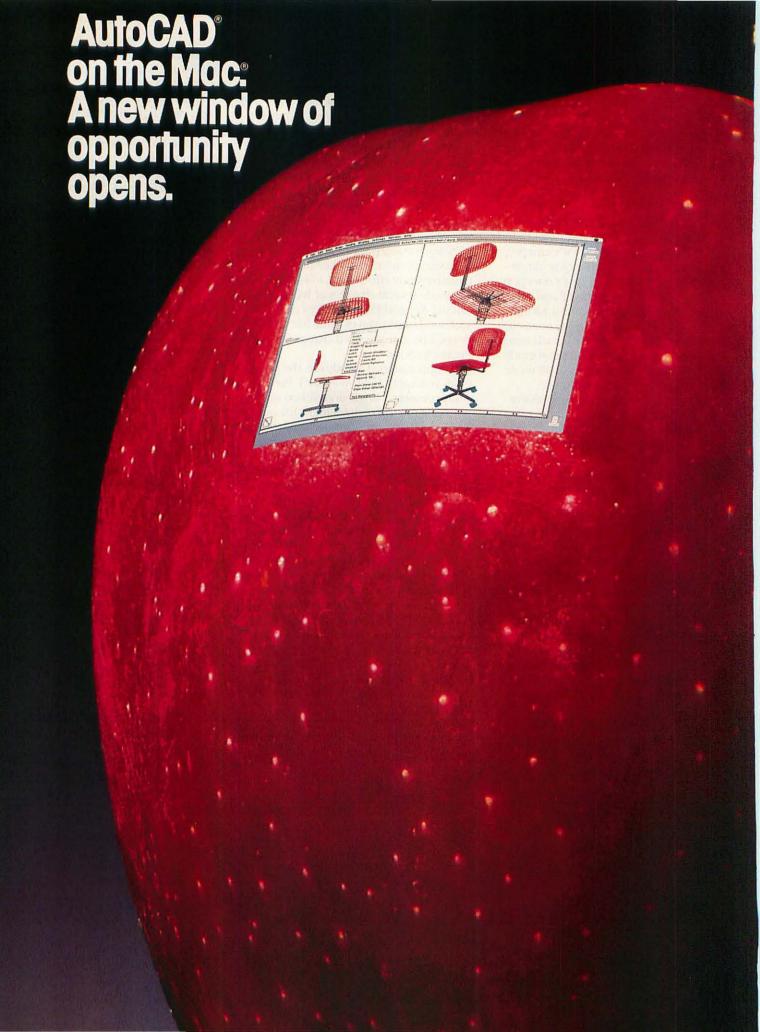
—Carol S. Holzberg

See Where to Buy for contact information.

Creating a Study File

The absence of a visible cursor at the end of the definition means that you don't know where the cursor is until you begin typing. Because the arrow pointer does not become an I-beam, you can't position the cursor over text to edit.





AutoCAD, the world-standard CAD software, now runs on your Macintosh II.

Your designs reflect the quality of your thinking. And your drawings reflect the quality of your designs. Put AutoCAD on your Mac II and nothing gets lost in the translation.

AutoCAD's extensive set of drawing tools enhances your productivity. Its effectiveness is proven every day by over 175,000 architectural, civil, construction, aerospace, electrical, cartographic, facility, industrial, manufacturing and mechanical design professionals around the world.

AutoCAD has been refined through ten major upgrades. You get menus full of powerful, high-precision drawing and editing commands, numerous drawing entities, and a multitude of easy-to-use features. You can window, zoom, fillet, scale, layer, annotate and associatively dimension, hatch, stretch and scale. And a simple click can undo anything or everything.

AutoCAD on the Macintosh also supports the features that have made Apple the acknowledged leader in user interface design, offering pull-down, tear-off, and pop-up menus, complete support for Multifinder™ and the Mac windowing system, along with file dialog boxes to make access to your drawing files quick and easy. Clipboard support allows the transfer of AutoCAD drawings to a wide variety of Macintosh applications software.

A Better Perspective. AutoCAD is an advanced three-dimensional modeler that helps you solve design challenges on your Mac the way you would with physical prototypes. AutoCAD makes 3-D easy with user-defined construction planes, dynamic viewing and multiple viewports.

You can also model complex surfaces with AutoCAD using sophisticated tools such as tabulated cylinders, surfaces of revolution, ruled surfaces and Coons patches so you can represent surfaces accurately.

For even greater utility, AutoCAD provides entity handles that allow external applications to associate alphanumeric information, such as part numbers and capacity ratings, with graphical elements in the drawing. This associativity is creating an entirely new generation of useful third-party applications software.

A Reflection of You. AutoCAD is an open-architecture system

including AutoLISP,* an embedded programming language that lets you program AutoCAD to reflect your way of doing things. Add your own menus to enter your own commands, write macros, develop custom symbols and drawing functions, or program standard procedures for document production and management.

Hundreds of third-party programmers have used AutoLISP to develop entire systems that make AutoCAD perfect for applications ranging from chemical engineering to technical publishing. Many of these programs run on the Mac II and more are on their way.

Maintain Your Standards. AutoCAD is the most extensively used, most broadly supported, widely taught design software in the world. AutoCAD is backed by over 1,400 highly-trained dealers and 150 Authorized Training Centers in 60 countries. We'll make sure you get what you expect from your CAD investment. That's what standards are all about.

Opportunity knocks just once. The CAD software you standardize on today will determine your productivity for years to come. To see a demonstration at the dealer nearest you, call Autodesk at 800/445-5415, extension 25, at your earliest opportunity.









AutoCAD makes Macintosh a standard player in CAD applications ranging from architecture to automated manufacturing. And AutoCAD is the standard for communication in the CAD world. AutoCAD's file portability allows scamless transfer of drawings and applications between different platforms and operating systems — without conversion to a generic format.



2320 Marinship Way • Sausalito, CA 94965

800/445-5415, Extension 25

Autodesk, the Autodesk logo, AutoCAD and AutoLISP are registered in the U.S. Patent and Trademark Office by Autodesk, Inc. Apple, Mac, and Macintosh are registered trademarks of Apple Computer. Multifinder is a trademark of Apple Computer.

Voyager 1.0

Desktop planetarium. Pros: Fast; shows many celestial objects; choice of sky projections; shows sky from any planet. Cons: Accuracy insufficient for some purposes. Company: Carina Software. List price: \$99.50. Requires: 1MB.

Voyager is a desktop planetarium that shows the sky as seen from any point on earth or from any planet. It also lets you see the sky's appearance at any time within a few centuries of the present. By speeding things up, so that years flit by in seconds, you can even watch the planets do their celestial dances.

Choose a View

Voyager's default display is called Star Atlas. You select which rectangular chunk of the sky you wish to see and in what magnification. A second view, Celestial Sphere, shows one hemisphere of the sky, much as a planetarium does. Local View is the third option. With it you see the sky as it appears from your own backyard-complete with horizon—which is useful if you're preparing for an observation, since the tiny white stars are simulated with exceptional realism. (Voyager screens have been reversed.)

Next you choose whether to see the planets, the constellation names and outlines, double stars, deep space objects such as galaxies and nebulas, celestial coordinate grids, or the sun's path along the zodiac. (Voyager, incidentally, is one of very few programs to correctly include Ophiuchus as the 13th constellation of the astronomical zodiac.) You can also se-

lect up to 9100 stars for viewing. And, of course, you set your location and the date and time.

You can change the orientation of the sky by scrolling and enter the appropriate time and, voilà, the sky redraws itself in seconds. The speed is astounding and encourages casual exploration.

Click on any object, and instantly you're given information about it: its name; brightness; celestial coordinates; rising and setting times; and in the case of the moon, sun, or a planet, its distance from both the earth and the sun. Or type in the name of an object, select Find and Center, and seconds later that object appears in the middle of your field of view.

Have You Been to Pluto?

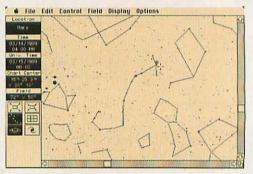
Voyager breaks our earthly bounds and lets us view the sky as it appears from any place within about 10 billion miles of the sun. A few mouse clicks and you're on Venus or the moon. For years I've watched Mars in our sky, but now I can watch the earth from Mars. (In March the earth is in Scorpius as seen from Mars.) From remote Pluto, the inner planets seem to huddle around the sun. I watched the February 20th lunar eclipse from the moon, where the earth blocks light from the sun in a partial solar eclipse. You can also look down on the solar system as seen from above and rediscover the laws of planetary motion.

The real sky is in continuous motion, but the motion is usually too slow to notice. The speed at which objects in Vovager's sky move when zipping through the centuries draws gasps even from people who have seen a lot of astronomy software. Go to Mars, set the date for New Year's Day in 2060, select an interval of one week, and

file Edit Control field Display Option

Halley's Comet, from Mars, 2060 A.D.

The next time Halley's Comet appears, people on Mars will watch it too. Here is its path from New Year's Day 2060 to Thanksgiving, 2061, at oneweek intervals, through the constellations Orion and Taurus. The comet is the little square near the top. The constellation outlines are turned on.



You Are Here

The earth (top center) is entering Scorpius as seen from Mars on the 15th of March. The optional constellation outlines are turned on. Celestial grids and deep-space objects are turned off.

watch Halley's Comet loop through Orion and Taurus. Switch to Venus and watch the earth sail through the constellations. Sit billions of miles from the sun and watch the planets in their orbits.

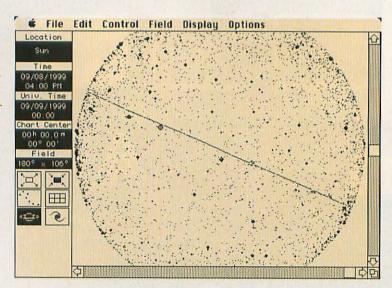
I'm most impressed by the ease with which Voyager moves through space and time, and the speed at which the program draws displays. The program's accuracy is more than adequate for most purposes, but you may need greater precision for critical applications (like viewing a close conjunction of a planet and star) or for dates more than a few centuries from the present. Nevertheless, this teaching tool should find a home in many astronomy courses.

Voyager calls itself a desktop planetarium, but that's an understatement. I work with a large planetarium, and it can't do a fraction of what Voyager does. Voyager lets you look at the sky and the solar system in ways you probably never even dreamed of before. —John Mosley

See Where to Buy for contact information.

Doom in 1999?

Cosmic catastrophists predict that an extraordinary planetary alignment in 1999 will berald the Second Coming and the end of the earth. Maybe, maybe not, but with Voyager you can see for yourself where the planets will be. This is the view from the sun on September 9, 1999, the planets are strung out along the ecliptic, the plane of the solar system.



Put a Seagate drive at the core of your computer

If you're one of the millions of people who have adopted computers with an SCSI interface, then you should be one of the millions who can use a drive from Seagate, the world's largest manufacturer of SCSI disc drives. These drives come in a wide variety of sizes, capacities and access times, making them ideal for every application.

Whether you're searching for an add-in or add-on subsystem, look for the drive that stands for quality and reliability worldwide and has made Seagate the first name in disc drives. Call us at 800-468-DISC or 408-438-6550 for information on where to purchase SCSI storage solutions.

Form Factor	Model	Capacity	Access Time
	ST125N	21 MB	<30 msec
	ST138N	32 MB	<30 msec
3.5" HH	ST157N	48 MB	<30 msec
	ST177N	60 MB	20 msec
	ST1096N	83 MB	20 msec
5.25" HH	ST225N	21 MB	65 msec
	ST251N	43 MB	28 msec
	ST277N	64 MB	28 msec
	ST296N	84 MB	28 msec





P51 Mustang Flight Simulator

Three-dimensional flight simulator. Pros: Attention to detail; superb Replay feature; fluid game structure. Cons: Only works on a Plus or an SE; takes practice to fly smoothly. List price: \$59.95. Company: Bullseye Software. Requires: 1MB; runs only on Macintosb Plus or SE.

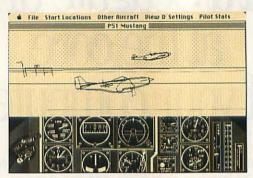
/ If there's a better way to relax than soaring high above the fields of France in a nimble World War II airplane, I don't know what it is; there's nothing like strafing the Eiffel Tower to release tension. The plane, the fields, and the tower can be yours in electronic form at least-in P51 Mustang Flight Simulator. This new program, by the author of the Ferrari Grand Prix and Fokker Triplane simulations, is difficult to classify; it's neither a shoot-'em-up arcade game like Apache Strike, nor a realistic-to-the-pointof-boredom simulation like the Microsoft Flight Simulator. Instead, P51 Mustang combines aspects of both, recreating the romance and glory associated with the Mustang fighter plane.

Climb Aboard

In P51 Mustang, there is no object of the game. You don't win, lose, or beat the clock. Sure, you can triumph by shooting down a German plane, and you can perish ignobly by plowing into the ground. But the emphasis is on the pure thrill of flying.

For that reason, there is no one situation, and no main flying mode. Instead, the program's menus offer a choice of locations and enemy plane characteristics, allowing you to determine your own adventures. For example, you could start in midflight over Paris, and opt either to simply admire the "scenery" or to engage an enemy plane in a dogfight high above the Arch of Triumph. Or you could take off from any one of six European air bases and search for trains, trucks, or air bases to strafe—with or without a German plane on your tail. Or, if you're less bloodthirsty, you may prefer to test your skill by flying around an air racecourse.

At any point in your aerial exploits you can halt the action and use the Replay feature. With this option, you can review your flight so far, in forward or reverse, at any speed, and from any camera angle, inside or outside of your plane. Not only is this a



Formation Flying

The only time you ever see what your plane looks like is during a Replay, when you can view your flight from outside the plane.

tremendous teaching aid, allowing you to spot your own flying errors, but it's also a good opportunity to gloat over your victories after shooting down an enemy plane, since you can replay your triumph over and over, in slow motion, from every delicious angle.

The Replay feature allows you a luxury that real life seldom does: the chance to relive a bungled situation with the knowledge of hindsight. If, in a certain dogfight, you were shot down because you banked left instead of right, all is not lost; you can Replay that flight up to the fatal moment, then turn the Replay off and continue the dogfight.

Enjoy the View

But how well does this simulation recreate the feeling of flying? As with most 3-D simulations for the Mac, details in the screen environment are sparse. You won't find clouds in the sky or trees on the ground, because the Mac has so much screen redrawing to do in order to create a convincing illusion of motion. Instead, you gauge your position by watching the occasional dotted lines that stretch along the ground to the horizon, and you try to keep an eye on the various meters on the cockpit's control panel. In general, the program creates the feeling of movement well; you may get positively queasy when flying the Mustang upside down or in loop-the-loops, and your ability to look out the windows in any direction adds to the realism.

What makes P51 Mustang charming, though, is its graphic style. The planes, trucks, and explosions are drawn in the crude, devoted manner of a war-fascinated teenager doodling in the margins of an al-

gebra notebook; when you shoot down a plane, you can almost hear the "Oh, cool!" as it bursts apart into shards of flying metal. If you are ungallant enough to blow up an airplane that's still on the ground, a tiny humiliated 3-D pilot stands on the runway next to the smoking wreck. And, when things aren't going well—for example, if you're not careful about the g-forces to which you're submitting your plane, and the wings fall off as a result—you can actually bail out, whereupon a parachute opens and you drift gently to the ground.

If it weren't for the obvious passion of the program's author for his subject, in fact, there would be much less to recommend. The program runs only on the Mac Plus and the SE, and even has problems running on an accelerated SE. Furthermore, flying the plane isn't easy; when you're a beginner, you'll notice a certain tendency for the plane to plummet crazily into the ground. Even once you're airborne, you might actually have trouble finding anything to do; enemy planes sometimes take their sweet time to attack you.

But once you've had some practice, you may become quite attached to P51 Mustang. The digitized sounds are terrific—there's the splash when you bail out over the English Channel; the squeak of tires when you land; the purr of the Rolls Royce engines, whose pitch changes as you adjust the throttle. And then there's the interactive aspect of the program—with the proper cable, you can hook two Macs together and have dogfights with a fellow aerophile. (You can't play via modem, however.)

Back to Earth

The P51 Mustang Flight Simulator isn't a landmark program for the Mac. It's not necessarily even the best flight simulator. But never was there a better candidate for the entertainment software category. Created by a programmer who takes obvious pride in his obsession with the P51 Mustang, it's a loving tribute to the bravado and agility of one of World War II's key players, and an opportunity to feel the thrills of wartime flight without risking so much as a fingernall.

And who knows? When you get back to your serious work, you might just see the ghost of a tiny set of crosshairs superimposed on the cells of your spreadsheet.

—David Pogue

See Where to Buy for contact information.

FOR THE PRICE OF A 16 GRAY LEVEL SCANNER, GET THE NEW DATACOPY 73 OGS.

Now get the high quality of a 64 gray level image for a price as low as others pay for 16 gray level scanners. It's a value that will make your published photographs, artwork, and reputation around the work-place look sharper than ever.

The 730GS also gives you greater control over your image's output size, file size, and resolution.

. **\$1,995**00

It comes with imaging software, cabling and interface.
It's compatible with both Mac and PC. And its small size will fit more conveniently on your desktop.
Let us tell you the other ways it will enhance your image. Call us, at 800-821-2898.

XEROX IMAGING SYSTEMS

Circle 376 on reader service card

Window Shopping

Programs that teach speed-reading, vocabulary, or help you with your taxes, plus paper for super output

by Lawrence Stevens

John F. Kennedy was said to be able to digest ten newspapers plus dozens of reports and hundreds of memos each day. Those of us who went to school during his presidency remember how speed-reading courses proliferated as parents tried to help their children "read like the president." Almost all of us who took these courses were able to increase our reading speed dramatically. But we also discovered that speed-reading was actually "speed scanning," a method of fishing the main idea out of a passage without reading each word. And while this eliminates all the pleasure of reading and tends to be exhausting after a while, it can be useful.

Speed Reader II 1.1

If you want to learn to speed-read, Speed Reader II can help with its six modules. Two of them, Warm-up Letters and Warm-up Words, flash letters and words on screen for increasingly shorter periods of time in order to help you recognize them more quickly.

The program's four remaining modules have you read passages at increasing speeds. For example, the Column Reading module scrolls a narrow, newspaper-like column on the screen, but only one line is visible at a time (the rest of the column is grayed out). Your job here is to read each line before it disappears. And the Paced Reading module displays one paragraph at a time; your job here is to finish reading the paragraph before it's replaced by another one.

The program's 35 reading passages are interesting and teach you such speedreading techniques as how to move your eyes across the page and how to eliminate inner speech while you read. After you complete each passage, multiple-choice questions test your comprehension. Some of these, however, are too easy and can be correctly answered by guessing, and they often include one or two obviously wrong choices. And because there are only 35 reading passages in the four modules, you soon start repeating passages. Even on your second time through, you'll have a hard time determining if you are really reading faster or just remembering.

Despite these problems the program can help you increase your reading speed since doing so is not hard once you learn a few basic techniques. If you don't want to spend the time and money to take a speedreading course, this is the next best thing.

Word Attack 1.0

For educational software to be valuable, it should do more than simply replicate a workbook. Word Attack, a vocabulary builder for grades 7 through 12, partially meets this criterion by providing a point-and-click interface and a video game, but it doesn't go far enough in making use of the Mac's capabilities.

You choose a lesson by selecting a difficulty level and indicating whether you want to work with adjectives, nouns, or verbs. The vocabulary is difficult. Level 1,

thick; crowded Southern California is an area with a very

Word Attack

The Word Usage module requires recall, correct usage, and accurate spelling. You must complete the sentence by typing in the correct word. If you make an error, the entire list of words in the file will appear at the right so that you can see the spelling and correct your error.

which is supposed to be for fourth graders, includes dour, ominous, peer, and yearn. While not necessarily familiar to children at a certain grade level, as the manual points out, these are all words they are capable of learning. Each lesson is made up of 25 words, so the entire program of nine levels times three parts of speech teaches 675 words. You can also create your own word lists.

The first module in each lesson, Pretest, is a multiple-choice quiz that determines the words the student already knows. Testing children on words they have not yet learned can have a discouraging effect, and that should be weighed against the advantage of being able to assess the student's level in order to plan lessons. But, incomprehensibly, Word Attack does not eliminate the words answered correctly in Pre-test from any of the lesson's succeeding modules. In fact, except for one trivial instance, the results of Pre-test are totally ignored.

The second module, Word Display, teaches the meaning of the words the student worked with in Pre-test. The list of 25 words appears on screen. When the student selects a word by clicking on it, its definition and an example sentence are displayed, and the word is pronounced by the Mac's synthesized voice. This is a valiant attempt but one that fails because of an imperfect medium. The Mac's voice is just not good enough to teach proper pronunciation. Parents or teachers who use this program will do better to turn off the voice and help the student with pronunciation themselves.

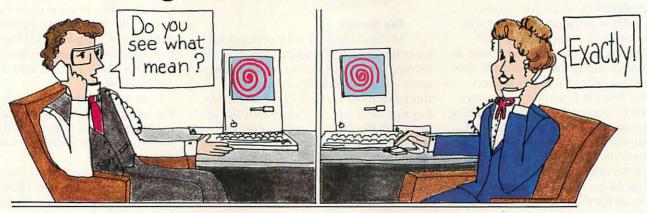
The next three modules—Multiple Choice, Word Match, and Word Usage—all provide different types of drills for the same 25 words. Each of these modules

(continues)

Desktop Express



because great minds seldom think alike.



The Meeting of the Minds With Desktop Express™ software, the great mind in New York can see what the great mind in L.A. has been trying to say.

Send text *and graphics*, using a Macintosh[™], a modem and MCI Mail[®], to your associates in the next office, or in the next state. With this new electronic mail and document delivery service, they'll get the picture clearly anytime – day or night – via MCI Mail.

Desktop *Express* extends the 5 o'clock "express" deadline, so working across time zones can be as efficient as working across the hall. And, it replaces those fuzzy facsimile figures and forecasts with high resolution graphic presentations. Send ideas back and forth in a matter of minutes and accomplish in an afternoon what would normally take several days of overnight courier exchange.

Created by Dow Jones, Apple, and MCI, Desktop *Express* works with the Macintosh software programs you've come to rely on. Create a business plan complete with charts, graphs and spreadsheets. Send it to any of your associates who have Desktop *Express*. They can review the plan and even print it – all *without* the software program you used to create it. But if they do have the program, and Desktop *Express*, they can revise your document on the spot and return it to you.

For your associates who don't own a Macintosh, Desktop *Express* still delivers. Direct your documents electronically to an MCI Mail Print Center. There they will be printed on a laser printer and delivered via postal or overnight delivery.

With Desktop *Express*, your big ideas will get looked over, not overlooked. For orders or inquiries, contact MCI at **1-800-444-6245** or at MCI ID **267-1163**.

Desktop Express. Now, great minds don't have to think alike to get the picture.



Reviews

keeps track of correct and incorrect answers, and lets the student repeat the drill until all the words are defined correctly. But there is no carry-over; no matter how well the student does in one module, he or she must start again with the same 25 words in the next module.

The Word Attack video game is visually and audibly interesting but unimaginative in concept. It's basically a multiple-choice test, but instead of clicking on the correct answer, the student zaps it with a wizard's wand.

There is little doubt that a student who uses Word Attack regularly will increase his or her vocabulary. But the program would be much more effective if it incorporated more complete diagnostic tests with which to create customized lessons.

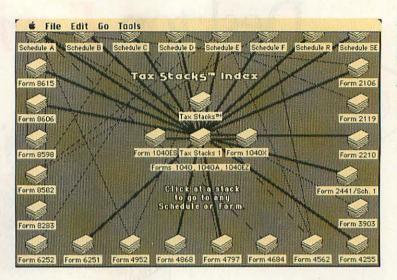
Custom Menu Tutorial

It's difficult to understand how a company like Microsoft, which has created some of the best personal-computer software, can't seem to write manuals that clearly explain how to use that software. In the Macintosh world, this is especially true of those Excel utilities that require programming, like the functions and macros, and now with version 1.5, its custom dialog box and custom menus. Heizer Software, which has distributed over 30 tutorials for Excel, has come up with 2 more to teach these new 1.5 utilities.

Let me begin with a warning: these programs are for the experienced Excel user who is comfortable with programming command macros. Even advanced users will have to spend considerable time on these tutorials. A custom menu is actually a macro, and a custom dialog box is a table within a macro. Dialog boxes especially take some work to plan and create.

Each tutorial, which works along with your copy of Excel 1.5, provides a macro sheet that gives examples of the dialog box, and menu commands and a work sheet to show the results. The examples start with the basics and move on to the complex, so that when you're finished, you've seen almost the entire range of possibilities.

As with all Heizer tutorials, the teaching method is to demonstrate more than to explain. First a short description of the macro appears on the screen, then you run the macro, and finally you study how it works. The last tutorial requires spending time both looking at the macro commands and reading the Microsoft manual to un-



Tax Forms in Tax Stacks

Most of the forms in Tax Stacks are linked so that data from the total line of one form is carried over to the appropriate lines on other forms.

derstand what each command does. It's a method of learning that requires a lot of effort on the part of the student.

Tax Stacks

Tax Stacks is a set of HyperCard stacks for completing and printing 1988 federal income tax forms. One of the nicest features is that the program uses two or three questions on each card to walk you through the forms. This questionnaire approach makes filling out the forms less complex because it allows you to focus on small slices of data at a time. There are other advantages as well. Each card has a scrollable field, accessed through a button, with IRS instructions about the two or three listed questions. Each card has a notes field as well, also available through a button, on which you can type reminders. You can raise a flag on any card to signify that you have not completed all the questions on it. Before printing a form, the program returns you to cards with raised flags. You can also flip through all the cards with raised flags.

Each card has a calculator button that takes you to a calculator card for figuring, and then cutting and pasting entries. The only advantage this calculator has over the Mac DA calculator is that it has a scrollable tape, so you can check your entries for accuracy. It is also about ten times slower to access and remove than the DA version, so I ended up using the DA most of the time.

After you finish the questionnaire, the program sends the data to the appropriate IRS forms, which appear on screen (half a page at a time). If you want to make changes to any of the entries on the form, you click on the appropriate field, and the program returns you to the card where you entered that data.

The forms are linked together so that the total line will be transferred to the appropriate space on other forms. However, check to make sure the carry-overs actually occur. The program also includes most worksheets, including IRA, Earned Income Credit, and Social Security Benefits—the results of which are not carried over automatically.

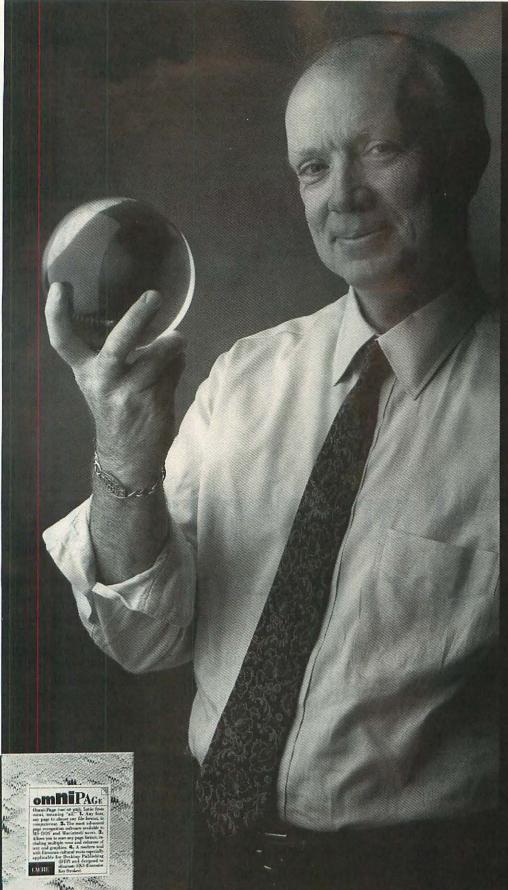
In general, this program is self-operating and easy to use. However, a good working knowledge of HyperCard will be helpful if you get into trouble or want to use a shortcut.

My main complaint is that the program tries to be too cute. I don't think that substituting a poorhouse for the Home button, or having a main card with an animated dollar bill flying away, is particularly funny. Nor do I like the fact that I'm subjected to a 15-second rendition of "Yankee Doodle" every time I open this stack. And I could do without the tax jokes that you can get to on each card by clicking on the Jackin-the-Box button. This is a good program in its own right; it doesn't need the corn.

Pro-Tech Computer Paper and Film

James River Graphics sent me a sampling of its unique Pro-Tech line of paper. There is a different type of paper for laser, ink-jet, thermal-transfer, pen-plotter, and impact printers. Compared to the standard copy paper that I normally use on my LaserWriter, the Pro-Tech paper does provide much better contrast.

See Where to Buy for contact information.



omni PAGE

Customer Profile

Regis McKenna

Age: Old enough to remember the day that Intel Corporation was founded.

Profession: Chairman of Regis McKenna Inc., a major marketing company based in "Silicon Valley." A general partner in the venture capital firm of Kleiner Perkins Caufield & Beyers. Author of the Regis Touch and most recently, Who's Afraid of Big Blue?*

Hobbies: Enjoys doing extensive research on innovative new technologies. He recently became involved in building and archiving an extensive database, using state-of-the-art page recognition software.

His Page Recognition Software: OmniPage of course. According to Regis: "OmniPage represents one of the most complete page recognition software products; providing incredible flexibility to customize data which can be easily accessed later. All of a sudden the cost of archiving and retrieving data has dropped significantly. The 'Information Age' is upon us and we have an exciting new tool!"

Favorite Quote: The New York Times: "OmniPage could be the most significant advance in personal computing this year."

Things Disliked Most: "Technology that is not easily accessible or powerful enough to serve the needs of people."

Favorite Scan: "I'm using OmniPage to build an extensive electronic library that pertains to the growth and evolution of technology over the past 25 years. Being able to scan literally any article, regardless of layout or column format, has suddenly made this all possible. It's eliminated the labor intensive task of data entry. I'll be able to share this information with employees, customers and colleagues over time. It's an exciting collection of business case studies for future reference."

Future of Page Recognition: "OmniPage has provided me with the customizable tool that I need. I can use the Partial Page feature to scan only that text which is relevant to my needs. Having a version that runs in MS-Windows should impress those who are committed to that environment. What we're seeing here is the emergence of a new product category."

For More Information Write: Caere Corporation 100 Cooper Court Los Gatos, CA 95030 Or Call: 1-800-535-SCAN

LOS GRIOS, CA 95030 OF CAIT: F-000-555-5CAIN
OmniPage is a registered trademark of Caere Corporation. MS-DOS and
MS-Windows are trademarks of Microsoft Corporation. © 1988 Caere Corporation.
**Regis McKenna's exciting new book, Who's Afraid of Big Blue, is available in hardcover and
published by Addison-Wesley Publishing. © Copyright 1988, Caere Corporation. All rights reserved.

CAERE



Novell presents a net even the pickiest

Macintosh owners have a reputation for being fanatical about their Macs. And rightfully so, when you consider the elegance of the Macintosh user interface.

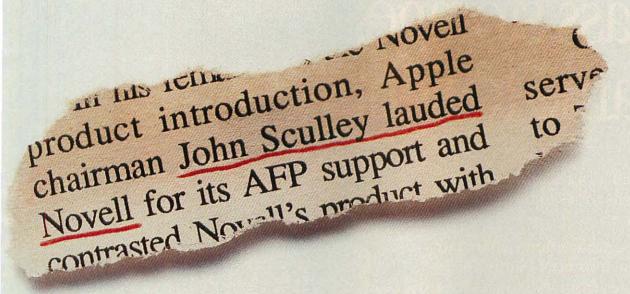
So when Novell set out to network the Macintosh with PCs, it was with one clear caveat: preserve the Mac environment. Create network software that would feel right to the pickiest of all Macintosh users. And none are pickier than the ones at Apple.

Full AppleTalk compatibility. Working directly with Apple, Novell's programmers created a version of NetWare® that is compatible with the AppleTalk Filing Protocol (AFP). It's

an achievement hailed by Apple President and CEO John Sculley as "a very significant event for the industry." And it means that Mac users can now get all the power and flexibility of the number one local area network in the world, without sacrificing any Macintosh functionality.

AFP compatibility also means that NetWare for Macintosh will be fully compatible with future Macintosh hardware and operating system versions. So you can take advantage of new Macintosh product releases as soon as they become available.

Freedom to choose. NetWare for Macintosh lets you connect Macs with a



InfoWorld, June 20, 1988

work made to satisfy Macintosh user.

myriad of PC, minicomputer and mainframe environments, including OS/2. So you can choose the workstation environment that best suits your needs while communicating easily between dissimilar operating systems and sharing files and peripherals.

You get all the performance, security, fault tolerance and functionality of NetWare without changing the way you work with your Macintosh. And you get the power to transparently connect to over two million NetWare users worldwide.

To satisfy your need for a powerful Macintosh network, plug into NetWare—the

network that passed the ultimate Mac test drive. See your Gold Novell Authorized Reseller, or call 1-800-LANKIND.

For more information, call from your modem 1-800-444-4472 (8 bit, no parity, 1 stop bit) and enter the access code NVMC17.



For network solutions, you should be seeing red.

The best kept secret on mass storage, just came to light.

Until now, its been a big secret that CMS Enhancements sells more external hard disks, than anyone.

Our MacStack™ Series come in 20 to 140 megabyte models. Our new Platinum™ Series come in sizes from 40 megabytes up to 2.4 gigabyte models. And they're ready to use right out of the box – just plug one into the SCSI port of your favorite Macintosh.™

Every preformatted, fully tested drive, comes with our powerful easy-to-use utility software. And the heads park automatically at "Shut Down" to guard against data loss when moving or shipping.

Ask your favorite dealer to see our full line of mass storage products including our MacStack,™ the Pro™ Series internal, our new Platinum™ and the Platinum i™ internal hard disks, tape back-up subsystems, removable drives, and CMS accessories for Macintosh.™

CMS Enhancements, ... we're no secret anymore.



Enhancements, Inc.

For the dealer nearest you call: (714) 259-9555



New Products

Information on the Mac's latest hardware, software, and accessories

Edited by Mary Margaret Lewis

This section covers Macintosh products formally announced but not yet evaluated by *Macworld*. All prices are suggested retail. Please call vendors for information on availability.

HARDWARE

ADEX Chromatron Color graphics monitor with multiple scan rates from 31kHz to 67kHz with automatic color tracking. \$3595. Telegen, 415/326-6103.

HDD32 Hard Drive Portable 32MB SCSI external hard drive. Compatible with Mac 512KE, Plus, SE, II, and IIx. Has an external SCSI address switch and automatic head parking. \$499. Ehman Engineering, 307/789-3830.



HDD32 Hard Drive

Hurdler Centronics Parallel Interface Board Mac II NuBus add-in board that connects a Mac II to any device that uses a Centronics-compatible interface. \$199. Creative Solutions, 301/984-0262.

LightningScan Hand-held scanner that transfers images up to 4 inches wide to a Mac Plus, SE, or II. Includes editing



LightningScan

tools and supports TIFF, EPS, PICT, and paint formats. \$549. Thunderware, 415/254-6581.

Local PhoneTalk Device that connects Mac or printer to an AppleTalk network using standard telephone wires or any unshielded two-conductor cable in place of AppleTalk cables. \$49.95. AESP, 305/653-0898.

MagicNet Network connector node with cable and terminator. Effective at distances up to 3000 feet using standard telephone wire and RJ11 connectors for node connection. \$24.95. MacProducts, 512/343-9441.

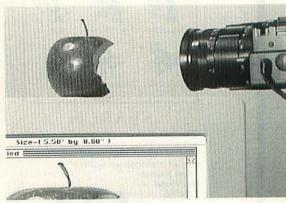
MaraThon SP Plug-in Mac II interface that adds I/O ports. Adds an RS-232C standard serial port accessed through an IBM-style DB9 connector, and a Centronics parallel port accessed through a DB25 connector. \$299. Dove Computer, 800/622-7627.

MixNet MixNet 8884 mixes a business phone system and a computer network over a single cable. MixNet 438 mixes LocalTalk cables with modular phone jacks and is compatible with all LocalTalk cabling systems. MixNet 448 connects printers through AppleTalk to small networks. MixNet 8884 \$69; MixNet 438 \$39; MixNet 448 \$35. Thor Manufacturing, 800/346-4694.

QT-Mac150 Data-cartridge tape-backup system compatible with Mac II, IBM PC, and IBM PS/2. \$2795. Tecmar, 216/349-0600.

Scion Image Capture Board Image capture board for the Mac II that crops, centers automatically, and performs real-time capture and display at a rate of 30 frames per second. \$1195. Scion, 301/845-4045.

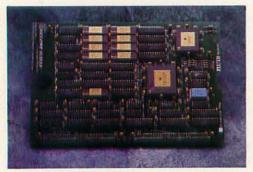
(continues)



Scion Image Capture Board

New Products

Si3033 Accelerator Mac II accelerator that operates at a clock rate of 33.3MHz. Compatible with all Mac II software including A/UX. \$3999. Siclone Sales & Engineering, 408/734-9151.



Si3033 Accelerator

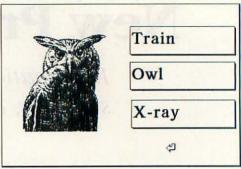
Smart Kid Connectivity application that works both as a stand-alone and on the AppleTalk network. Does one-to-one translation of all format codes to enable bidirectional sharing of word processed documents between the Mac and a variety of dedicated word processing systems. \$7500. Interpreter, 303/431-8991.

SoftStep Memory Modules SoftStep I (256K) and SoftStep II (¾MB) are memory modules that come with sockets. SoftStep III for the Mac II has no memory and allows four 256K SIMMS to be placed in one slot in the Mac II. SoftStep IV for the Mac Plus allows you to install four 256K SIMMS. SoftStep I \$549; SoftStep II \$1395; SoftStep III and IV \$195 each. Computer Care, 612/920-2273.

Tele-Scrambler I Plug-in security unit that scrambles signals for both voice and data transmission. Works with any computer modem. Warning light indicates attempts at wiretapping or eavesdropping on the line. \$995. Metme Corporation, 312/215-2470.

SOFTWARE

Alphabet Pictures Animated graphics program for preschoolers with word- and picture-matching game. Digitized child's voice pronounces and spells words. 1MB



Alphabet Pictures

min. memory; requires HyperCard version 1.2.1 or higher. \$25 plus \$2 s/h. Clay Nixon, 502/896-6581.

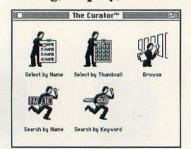
Aussie Joker Poker Mac poker game for up to 90 players. 512K min. memory. \$49.95. Joker Software, 619/387-8623.

Autoduel Car-to-car battle game that lets you customize your own futuristic car with such accoutrements as flame throwers and heavy armor. Battles take

(continues)

Image is Everything!

Catalog, display, and convert images in TIFF, PICT, Paint, GLUE™, Mac & IBM EPS formats.



SEARCH

"Because of its versatile selection methods and ability to recognize numerous file formats, I prefer The Curator to the other Mac art-management systems" Erfert Nielson

MacWorld



DISPLAY

"The Curator is a "free form" organizer that works with images where they are... The Curator streamlines the interchange of graphics between applications. For some users, this is reason enough to buy the package."

Carlos Domingo Martinez MacUser, Sept. '88



CONVERT

"Truly an essential utility... The file management routines are strong enough to justify its price. But its ability to integrate a variety of file formats makes it an important tool." Lawrence Magid MacWEEK, Jan. '88

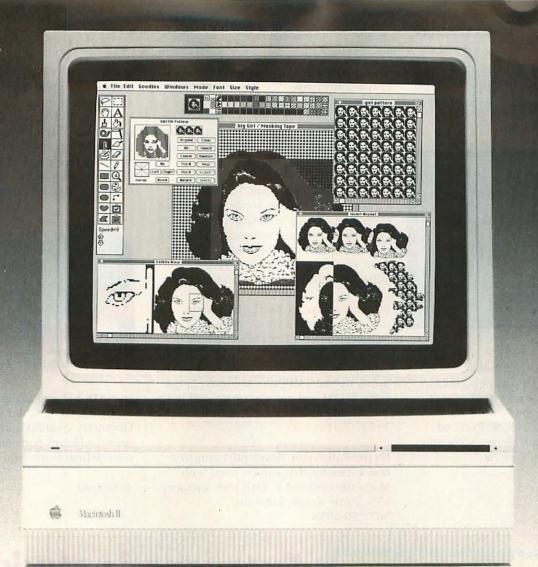
ORDER TODAY!

Retails for \$139.95.
Runs on Mac Plus* or larger.



30 Commerce St. Williston VT 05495 802-658-5506





NuPaint. It's way beyond super.

How far beyond?

Take all the features of the leading Macintosh® paint software—and double them!

No kidding. NuPaint is simply the most versatile, complete, easy-to-use—and fun Macintosh paint program yet:

13 viewing and manipulating modes (including double window Show Page, three Fatbits levels, multi-window support and re-sizable tool palette.)

93 creating-and-revising tools and techniques. And more than 100 different standard patterns, plus infinite capability to create and edit your own.

Borders and backgrounds up to 32 x 32 pixels! Frames of any shape up to 16 x 16. (Compared to 8 x 8 maximum of other Macintosh painting programs).

30 additional advanced techniques to give drawings and paintings your individual touch. (Examples: rotate image around any axis, skew, distort perspective and shadows.)

NuPaint doubles the print quality of the ImageWriter® and prints 300 dots per inch on the LaserWriter.

It's compatible with all programs that process Macintosh paint documents.

And all this for a price that's a lot less than super.

NuPaint is compatible with Macintosh

512KE, Plus, SE and II.

For more information call us toll free at 1-800-423-6837, in Texas 1-800-526-9269; or see us at the MacWorld Expo. NuEquation, Inc.

1701 N. Greenville Ave. Richardson, TX. 75081

NuEquation ™



place on freeways and in arenas. 512K min. memory; requires double-sided disk drive. \$39.95. Brøderbund, 415/492-3500 or 800/521-6263.



Autoduel

Defense Acronyms Database of more than 6500 Defense Department, military, and electronics acronyms in Microsoft Excel and Works formats. 1MB min. memory; requires Microsoft Excel or Microsoft Works. \$20. Heizer Software, 415/943-7667 or 800/888-7667.

The Elementary Signer General instructional software for the hearing-impaired child who is not familiar with sign language. Includes over 160 signed words. 128K min. memory. Silent version \$79.95; talking version \$99.95. Microtech Consulting, 319/277-6648.

Executive Information Systems

Explorer HyperCard application guides corporate managers in selecting business systems and related information technology. 1MB min. memory; requires HyperCard version 1.2 or higher. \$195. Softouch Software, 503/241-1841.

Executive Query Tool Application that uses Network Innovations' CL/1 to access a variety of database types. Results can be pivoted from tabular to report format. Can be customized to suit user's needs. 1MB min. memory. Single copy \$1000; volume discounts and trial runs available. Applications Design, 312/642-4144.

HyperEstimator Residential construction estimator that can be used with MacNail version 2.2. 1MB min. memory. \$95. Turtle Creek Software, 607/589-6858.

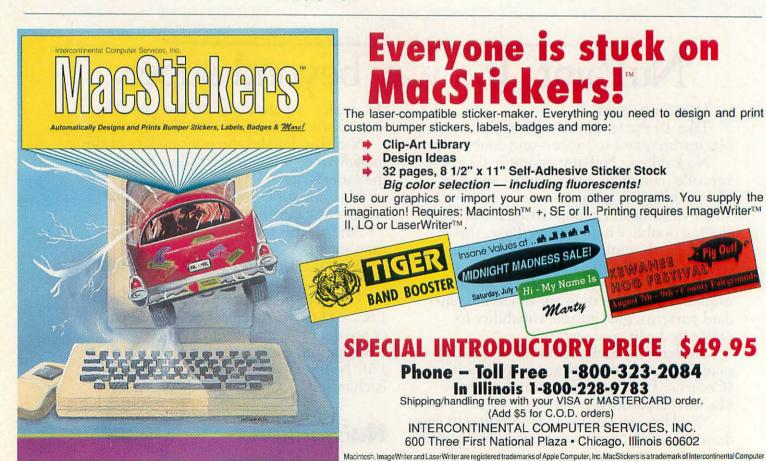
Images with Impact: Business I Clip art collection with over 175 occupational and business images in encapsulated PostScript file format. Files can be imported into any EPS-compatible program and can be opened in Adobe Illustrator or Aldus FreeHand. 1MB min. memory (2MB recommended). \$129.95. 3G Graphics, 800/456-0234.



Images with Impact: Business I

In-CAD 2-D drafting and 3-D solids modeling using tablet or text commands. Geometry creation and editing, subfigures for library parts and components, user-definable attributes and grouping.

(continues)



Services, Inc. All specifications and pricing are subject to change without notice

We have an accounting solution for everyone in the world.

And now we have one for the rest of you.

In the past, companies who selected the Macintosh* for its power and ease of use have been disappointed when it came to business software. Until now.

Introducing the new Database Accounting Library™ for the Macintosh from SBT. Complete with Macintosh full-user interface, it's the most flexible and comprehensive accounting software available. Here's why.

More Business Applications Than Anyone.

Designed on the most popular and powerful relational database, SBT's Accounting Library offers you up to fifteen specific business software modules. No other system offers you more. Running alone or integrated, they are the most extensive business programs on the Macintosh today.

Change It To Fit Your Specific Needs.

We provide free source code with every program. So the Library can be adapted to any business as it grows and changes.

Or adapted to any industry. Over three hundred vertical applications across 42 industries make the Library the most widely used accounting solution anywhere.

And because SBT supports the largest network of programming consultants in the world, installation or modification support is just around the corner.

No Business Too Small Or Too Large.

The Database Accounting Library can account for a business with one computer, or for a Fortune 500 with thousands. And because the Library supports AppleShare, 3Com, and Novell networks, you can share your data with all DOS systems. So even if your office is not entirely on the Macintosh, everyone else can keep up with you.

Five-Year Warranty.

SBT offers an unprecedented five-year warranty and free technical support on all its products. Try and find that anywhere else. And our Educational Products Division offers specialized training for resellers and end-users as well as developers.

For the past eight years, SBT has been providing business solutions for everyone in the world. And now there's one for the rest of you.

dinvoice/dStatements MultiNet Relea Invoices & CM Forms **Customer Statements** Business Status Report as of 10 Transaction Reports. Inventory Reports... Sales Reports... dinvoice/dStatements
Current Balance: 106532.63
PTD Billings: 55768.15
PTD Receipts: 53422.23
PTD COGS: 22475.84 dPd Current Baland PTD Payables: PTD Payments: Approved to Pay Other Reports.. entory Value Open Orders: PTD Orders: PTD Shipments PTD Gross Margin: Net Cash Forecast (Recalculate Print

File Edit Company Transactions Maintain

The Business Status Report on the Database Accounting Library is a complete control panel for your business. A set of instruments that gives you up-to-the-second status on what you're selling and what you're buying. On what you owe and what you're owed. All on the same screen.

Programs start at just \$395. Call now for more information, 800/227-7193 (415/331-9900 inside California). Or write to SBT, One Harbor Dr., Sausalito, CA 94965. If you are an authorized Apple dealer, call now for a free Feature Diskette.

© Copyright SBT Corp. 1988

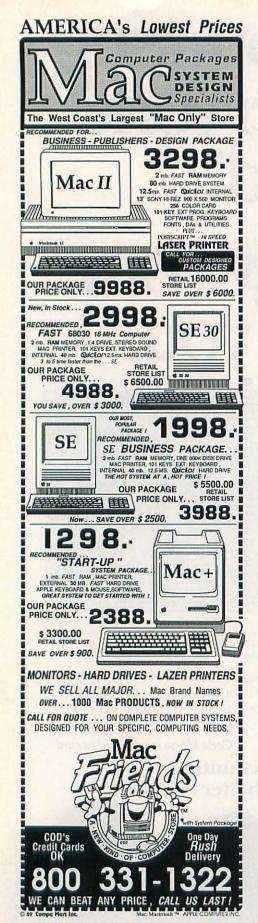
Circle 456 on reader service card

More than accounting, We stand for better business.





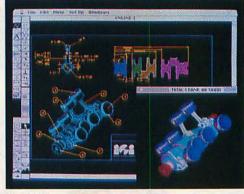
Trademarks/owner: Macintosh, AppleShare/Apple Computer, Inc. Database Accounting Library/SBT Corp. 3Com/3Com, Inc.



Circle 354 on reader service card

New Products

Makes increments automatically; has variable width lines and programming language. 2MB min. memory. \$1945. Infinite Graphics, 612/721-6283.

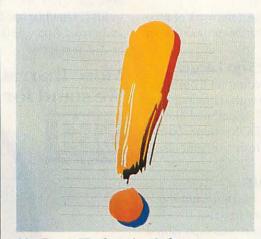


In-CAD

InTouch Utility that works with the Optacon tactile imaging device to give Mac access to people with impaired vision. Displays parts of the Mac screen as the mouse is moved. Users interpret images from a tactile array of vibrating pins. 1MB min. memory. \$395. TSI and Berkeley System Design, 415/540-5535.

MacBlast Data communications software for the Mac Plus, SE, and II. Comes with standard terminal emulation, supports MultiFinder for background file transfer, and provides connectivity with a variety of operating systems. 1MB min. memory. \$195. Blast Communications, 504/923-0888.

MacBravo Workstation Software CAD/ CAM applications for the Mac II. Modeler is for 3-D wire-frame modeling and mechanical design. Detailer is a mechani-



MacBravo Workstation Software

cal drafting detailer. Modeler \$1495; Detailer \$1995. Schlumberger Technologies, 313/995-6000.

MacDiskManager Automatic disklabeling system that prints labels using information from disk directory. Sold separately or with plastic pockets and label inserts. 128K min. memory. Kit \$89.95; software only \$59.95. Weber & Sons, 201/431-1128 or 800/225-0044.

MacLabeler Plus Disk-labeling program with four levels of automation. Use predesigned label templates or create your own. \$79.95. Ideaform, 515/472-7256.

Magic Series Bundled series of Mac productivity tools. Contains FileMagic INIT file, WindowMagic for window control, and MultiMagic, which allows the configuration of multiple sets of applications and DAs. 512KE min. memory. \$99. Magnus, 206/742-1633.

MaxPage Page-makeup software that imports and accepts files produced with most drawing programs. Allows text and graphics to be placed anywhere on the page. 512K min. memory. \$89. Applied System and Technologies, 315/675-8584.

Minimum Requirements Spreadsheet program for small businesses to record and report transactions. Automatically generates profit and loss statements as well as a tax report. Excel and Full Impact versions available. 1MB min. memory. \$29.95. Spreadware, 415/794-4388.

MultiDisk Disk-partitioning software with password protection that encrypts data within a partition. AppleShare and TOPS network users can remotely mount partitions. 512KE min. memory. \$39.95. Alsoft, 713/353-4090.

NumberMaze Educational software for ages 5 to 12. Kids solve math problems while they wind their way through mazes. Math levels vary from simple counting to division and multiplication. Includes word-problem generator. 512K min. memory. \$49.95. Great Wave Software, 408/438-1990.

(continues)

45 MB Removable Cartridge SCSI Hard Disk Drive



Micro/Removable Cartridge Hard Disk Drive

The Micro/Removable, 25 ms, 45 MB winchester hard disk is faster than some fixed hard disks. They are excellent for organizing related data or for fast back-up of fixed hard disk drives. The cartridges can be locked away for security or safely mailed to remote locations and have the reliability of a floppy diskette. You can boot from the removable, if needed, and the system is compatible with the Macintosh Plus, SE or Macintosh II. Utility includes password protection and a DA to mount volume.

Micro/Stack Series Fixed Hard Disk Drives

MicroNet offers 30, 46, 62, 91, 173 MB, fast access hard disk drives, as well as a 150 and 300 MB streaming tape backup system in a stackable cabinet. Internal brackets available for the Macintosh SE or II. Great care was taken in the design of these systems to ensure reliabilty. 150, 300, 600 MB, 16.5 ms, Wren III, IV and V Systems.

MicroNet specializes in Control Data drives that are industry known for their reliability and speed. Internal and external systems with tape combinations available.

We are dedicated Macintosh only developers.

Call for the name of your nearest dealer. Product data sheets gladly sent on request. Charles F. McConathy, President





MicroNet Technology,

13765-A Alton Parkway FAX: (714) 837-1164 • AppleLink: D1656

Irvine, CA 92718

Telephone: (714) 837-6033 Compuserve: 76004.1611

Save on Macintosh Systems

Complete Ready-to-Run Systems to Meet Your Needs

Macintosh SE 45 Meg System

System Includes:

 Macintosh SE Computer w/ 2 800K Internal Drives
 1 Megabyte of Memory

Seagate 45 Meg. Internal HD (40ms)

- · Keyboard and Mouse
- ImageWriter II Printer
- Save
- ImageWriter II CableHyperCard Software
- Over \$995!
- Diskettes-Box of 10
- Dust Cover for Mac SE
- Dust Cover for ImageWriter II
 Computer Paper-Case of 1200

Sugg. List \$4795 Package #8945

CDA \$3799

Write for our free Apple Users' Catalog
A full line of systems, hardware, software and accessories.
30-Day Trial Period

If you're not 100% satisfied, simply return the purchased goods [software, media, internal components excluded) within 30 days of receipt, for a quick, courteous refund (freight excluded).

Service and Support

CDA offers a full 90 day warranty.

Apple Computers - CDA is not an authorized Apple dealer, therefore during the 90-day warranty period Apple items must be returned to CDA for warranty repair.

Shipping Information and Policies
Shipping Charges - UPS Ground Shipping, add 3% (\$3.50 min); UPS Blue 2-day service and Alaska, Hawaii, PR, add 6% (\$6.50 min); APO/FPO Shipping, add 8% (\$6.50 min); APO/FPO Shipping, add 8% (\$6.50 min). Foreign orders ship via DHL. Please call or fax for rates and more info. Payment - Visa, MC, Amex. Discover and Optima welcome. Amex add 2% of order. Cashier checks and money orders ship promptly; personal checks are held 10 days for clearing. No CODs please. All prices subject to change. Apple, Macintosh, ImageWriter, & HyperCard are reg. trademarks of Apple Computer Inc.



CDA Computer Sales 1 CDA Plaza, PO Box 533 Califon, NJ 07830

Mon-Frt 9am-10pm, Sat. 9am-5pm EST Customer Service (201) 832-9007 Fax# (201) 832-9740 Compuserve's Electronic Mall- GO CDA

US/Canada Call Toll Free 800-526-5313

NJ/Outside US 201-832-9004

· CV computer sales

Circle 32 on reader service card

THE BEST TYPE BOOK MONEY CAN BUY.

This priceless professional tool is yours free. Simply mail the coupon below or call Adobe Systems toll-free at 800-83-FONTS.

Adobe, developer of the Adobe* Type Library and PostScript* software, is the world's authority on electronic publishing.

This full-color, 11"x15", 32-page Font & Function" catalog is jampacked with helpful tips and problem-solving advice from Adobe type and design experts. Plus, it's got samples, interviews and more than 300 high-quality Adobe type-faces for you to order. You'll see



how easy it is to publish like a pro with your Macintosh* or IBM* PC computer, PostScript printer and a little help from Font & Function, the Adobe Type Catalog.

Get yours today. FREE. Just call 800-83-FONTS. Or write Font & Function, P.O. Box 7900, Mountain View, CA 94039-7900.



Adobe and PostScript are registered trademarks and the Adobe logo and Font's Function are trademarks of Adobe Systems incorporated, Macintosh is the registered trademark of Apple Computer, Inc. IBM is the registered trademark of International Business Machines.

FREE.

01-12

To receive your free Font & Function Adobe Type Catalog, mail to: Font & Function, P.O. Box 7900, Mountain View, CA 94039-7900. Please allow 4 weeks for delivery.

I use a ☐ Macintosh ☐ IBM PC computer (Check appropriate box[es])

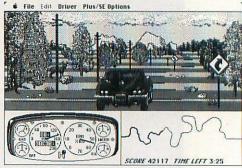
NAME			
TITLE			
COMPANY		Jes ar en en en	
ADDRESS		CITY	
STATE	ZIP	PHONE	-

New Products

Personal Reference Catalog Hyper-Card application for reference material management. Works in three different search modes, with cross-referencing between topics. 1MB min. memory. \$72. Delphinus, 508/448-2836.

Printer Interface III Software to connect the Mac with the HP DeskJet printer. Uses all Mac fonts, Hewlett-Packard's built-in fonts or font cartridges, and standard interface cable. 512KE min. memory. \$125. DataPak Software, 808/965-7796.

RoadRacer High-performance driving program that lets you maneuver a 1965 Corvette through five environments from desert flats to mountain roads. Features sounds, graphics, obstacles, and crashes. 1MB min. memory. \$69.95. Practical Computer Applications, 612/427-4789.



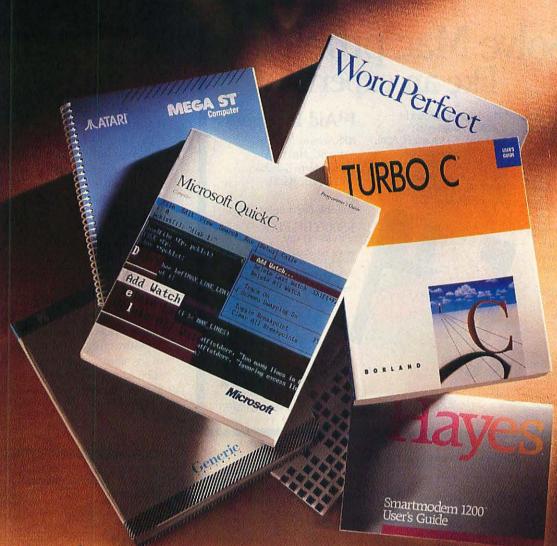
RoadRacer

Say & See Real-time speech processing software that displays animated cross section of the vocal tract. Designed for speech therapy, language lab use, and dialect and voice coaching. Ships with microphone and digitizer. 512KE min. memory. For price and licensing information, contact vendor. Emerson & Stern Associates, 619/457-2526.

Sports Award Library Award Library for Award Maker Plus with award styles for males and females, ten additional border styles, and four additional fonts. 512K min. memory. \$29.95. Baudville, 616/698-0888.

SuperCard Software development toolkit creates customized applications. Includes color painting and drawing, graphics support, and sound and animation

(continues)



Why just read the book when you can talk to the people who wrote it?

RoundTables on the GEnie™ service are a good way to pick up expert knowledge fast. Because they're the best way to talk to experts at the leading companies. People like Apple's Jean-Louis Gasse, Tandy's Ed Juge and Atari's Sam Tramiel are frequent guests. Providing in-depth answers and updates that can save you time as well as money.

GEnie can save you money another way, too. We bring you expert input at the very best rate. Just \$5 an hour.* So you can stay online longer for a whole lot less.

And with GEnie signing up is as easy as one, two, three. (1) Set your modem for local echo (half duplex), either 300 or 1200 baud. (2) Dial 1-800-638-8369. When connected, enter HHH. (3) At the

U#=prompt enter XTX99699, GEnie then RETURN. And have a major credit card or your checking account number ready. For more information in the United States or Canada, call 1-800-638-9636.



We bring good things to life.

LIK Companie

Solve Mac problems like an expert!

"Ist Aid Kit™ falls into that special category of 'must-have' products" (MACazine, April '87). It lets you handle every Mac problem from difficulties copying files, printing, and using Apple Talk networks, to recovering lost data from deleted or damaged files and unreadable disks.

Acclaimed by novice and expert alike, the 1stAid Kit is much more than powerful software. At its core is a clearly written reference manual that:

- lists every imaginable error condition
- helps you quickly track down solutions to any problem
- takes you step-by-step through each recovery effort
- shows you how to avoid problems

Macintosh is a trademark of Apple Computer, Inc. 1st Aid is a trademark of 1st Aid Software, Inc. "The definitive product for troubleshooting on the Macintosh" (Macworld, April '87). It "stand[s] head and shoulders above any other product like it . . . I can't recommend 1st Aid Kit strongly enough" (MACarina, April '87)



1stAid Kit \$99.95

HFS Version: MacPlus, Mac SE, Mac II MFS Version: 128KMac, 512K Mac, MacXL

Available direct order 24 hrs.

1-800-THE-FIXR In MA 617-847-4190

VISA & MC accepted, \$5 s/h UPS ground, in MA add 5% tax Not copy protected Dealer inquiries welcome

1st Aid

42 Radnor Road, Boston, MA 02135

Circle 60 on reader service card

We all know backups are necessary. Without them, you're pretty much hoping that your hard disk will never, ever crash.

Butlet's face it. Backups

are not exactly fun.

It's probably your 145th favorite chore, somewhere between regrouting the tile and dropping a bowling ball on your foot.

Which explains why our Redux™ backup program has become so popular these days. It's easy-to-use, flexible, and fast.

Whereas most backup programs give you two options (one file or the whole thing), Redux lets you specify exactly which

files you want. And when.

You can then automate the entire process. And that saves time.

Lots of time.

As a matter of fact, MacWorld called Redux "almost fun backups." (Sep88)

Fair enough.

Redux by Dave Winzler
microseeds
publishing inc

For a free "I hate backing up." button, send us a self-addressed stamped envelope. Quantities are limited. Redux is a trademark of Microseeds Publishing, Inc. 4702 N. Hesperides St., Tampa, FL 33614 (813) 882-8635

Circle 366 on reader service card

New Products

formats. Compatible with HyperCard. 1MB min. memory. Under \$200. Silicon Beach Software, 619/695-6956.

Systems Planning Navigator Hyper-Card program aids in analyzing organizational needs and in developing an action plan. 1MB min. memory; requires Hyper-Card version 1.2 or higher. \$195. Softouch Software, 503/241-1841.

TCP/Connect TN3270X Communications package for TCP/IP networks that handles multiple active telnet sessions. Enables you to use File Transfer Protocol with Mac user interface and to use the Finger application. 1MB min. memory. \$295. Intercon, 703/435-8170.

Unitize Unit conversion utility designed for scientists and engineers. Contains 150 different quantities (such as energy, pressure, time) and more than 1000 units of measure. Distributed as desk accessory or application. 512KE min. memory. \$59.95. Rainbow Bridge Software, 513/984-6861.



Unitize

ACCESSORIES

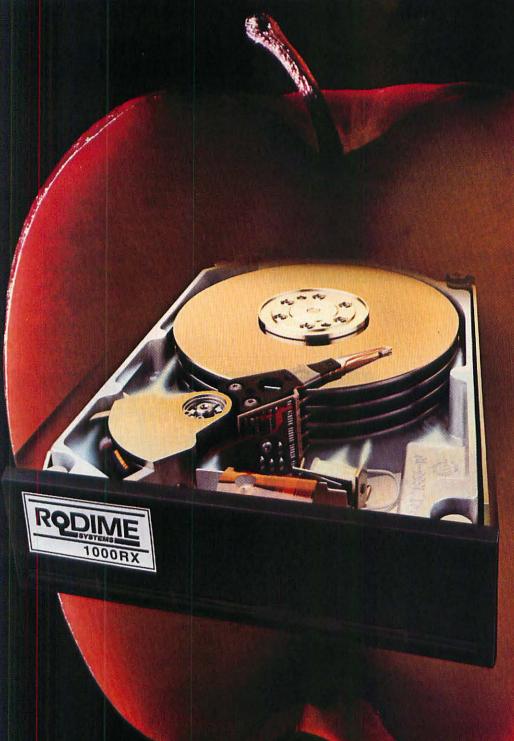
BigBin 1000 Motorized paper tray that holds 1000 sheets of paper. Available in three models that connect to laser

(continues)



BigBin 1000

AT THE CORE OF EVERY GOOD APPLE



The RX." Series offers the largest internal storage capacity in a half-neight hard drive storage capacity in a half-neight hard drive storage capacity in a half-neight hard tor your storage capacity in a half-neight hard tor your (140 megabyles) you can find for your (20 MB). Macintosh SE." and Macintosh II." (20 MB). Macintosh SE." and Macintosh SE." (60 MB). With the largest selection: 200 RX." (60 MB). 450 RX." (45 MB), and 1400 RX." (140 MB). 1000 RX." (100 MB) and 1400 RX."

Speed
Coupling capacity with speed, the RX
Coupling capacity with speed, the RX
Series of hard disk drives provide you with
one of the tastest average seek times (24
one of the tastest average solve Macinlosh
milliseconds) available for your Macinlosh
milliseconds)

Rodime, a worldwide manufacturer of disk drives and the largest supplier of third party hard disk drives for the Macinlosh innovation and support only an original innovation 33487

Rodime Inc., 851 Broken Sound Blvd., NW Rodime PLC, Nasmyth Road Rodimes, PLC, Nasmyth Road Sountield industrial Estates
Sountield Robinson

THE RX SERIES FROM RODINE Macintosh is a trademark licensed to Apple Computer Inc. Circle 149 on reader service card SYSTEMS

copyright 1988

Moving towards the speed of mind.

New Products

printers with Canon SX, Ricoh 4150, and Ricoh 4080/4081 engines. \$795. Laser Connection, 800/523-2696.

Cate's Erase-A Label Disk-labeling kits with erasable laminated labels, erasing fluid, color coding labels, and pen. Available in kits of 50, 100, or 200 labels. 50-label kit \$16.95; 100-label kit \$26.95; 200-label kit \$36.95. Cates & Company, 915/676-0844.

Control Power Device that controls power to the Mac with a key. Works with any computer or electronic equipment that uses a removable, three-prong power cord. \$99.95. Doss Industries, 415/861-2223.

ExecutivePad Laminated graphic mousepad designed to look like granite, wood, marble, or other surfaces. Available in seven styles. \$17.95. Publishing Ink., 818/500-7857.

GBC 1-Step Personal binding system that binds up to 30 pages in its own folder. Binding covers come in six colors and two spine widths. \$99. General Binding Corporation, 312/272-3700.

Mac II Standand Extension Cables

Combines Mac II stand, ADB Keyboard Cable, and Mac II Monitor cable extension kit. \$99.95. Kensington Microware, 212/475-5200 or 800/535-4242.



Control Power



ExecutivePad

To have your product considered for inclusion in New Products, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, Macworld, 501 Second St., San Francisco, CA 94107. We reserve the right to edit submissions. □



- Top Quality
- Surface Mount CMOS
- Guaranteed
- Static Protected

Expand your Mac memory by 1 to 8 megabytes economically. Diamond-Pac® SIMM's are 100% tested, state-of-the-art CMOS DRAM expansion modules manufactured in the USA by Logictron. Each Diamond-Pac® module is shipped with "fail safe" installation instructions, complete testing documentation, full antistatic protection, and a 2 year guarantee. To ensure the best possible price, call for a quote today. Delivery usually within a few working days. Available only from...

AMERICAN MICRO DISTRIBUTORS 16897-D Algonquin, Huntington Beach, CA 92649

714/840-5560

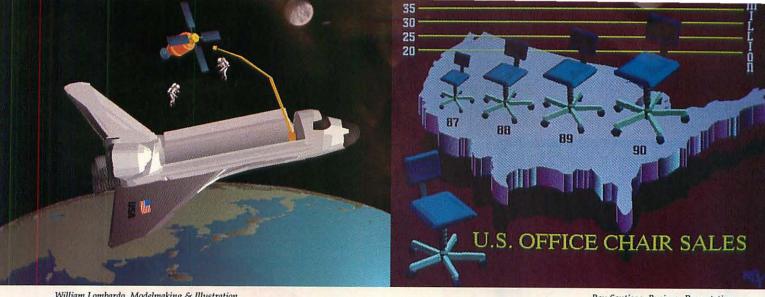
FAX:714-846-0570

MC VISA AMEX DISCOVERY

® MAC is a trademark of Apple Computers Corp., Diamond Pac is a trademark of Logictron, Inc.

Circle 403 on reader service card





William Lombardo, Modelmaking & Illustration Created with Swivel 3D and PixelPaint

"A superb presentation tool... Swivel 3D raises the standard of 3-D graphics on the Macintosh." Joost Romeu, MacWeek

"It's a speed-demon. It's your basic \$395 must-have." Salvatore Parascadolo, MacUser

"Creating objects with complex surfaces couldn't be easier...only Swivel 3D lets you cast shadows on images." David Peltz, MacWorld Roy Santiago, Business Presentation Animated Swivel 3D images in VideoWorks

"An amazing 3-D visualization tool that is easier to use than any of the 3-D packages...." Laslo Vespremi, MacWeek

"The most intuitive interface ever created for moving around in a computer environment....

A visualization tool that will keep you up around the clock—with a smile on your face."

Jack Davis, Verbum

"An amazi tool that any of the Laslo N
"The most interested for comp. A visualization you up with a self-state of the Laslo N with a

Paracomp Redefines the Graphics Standard

Swivel 3D, the essential Graphics Tool

Swivel 3D lets you create stunning graphics never before possible. By simply rotating, scaling and casting shadows, Swivel 3D generates a limitless amount of images from a single 3D drawing. Explore presentation ideas quickly — you have the power to produce your best graphic presentations and animations.

Create beautiful illustrations by combining the visual power of Swivel 3D's images with the special effects found in today's graphic applications. Swivel 3D's presentation images can be easily moved to popular paint and draw programs. For animation, Swivel 3D pastes a series of color animation frames to the Scrapbook which you can easily import into VideoWorks or Hypercard.

Swivel 3D is the first and only program to feature Linking. Linking allows you to create realistic images with wheels, doors, levers, arms, legs, and objects that move.

An extensive library of images, shapes and alphabets, is included. Swivel 3D is a powerful graphics program for anyone involved in animation, business presentations, and graphic design — it is the essential tool for all of your graphic needs.



Three-Dimensional Drawing/Modeling for the Macintosh.

Suggested Retail Price: \$395

Minimum System Requirements: 1 meg

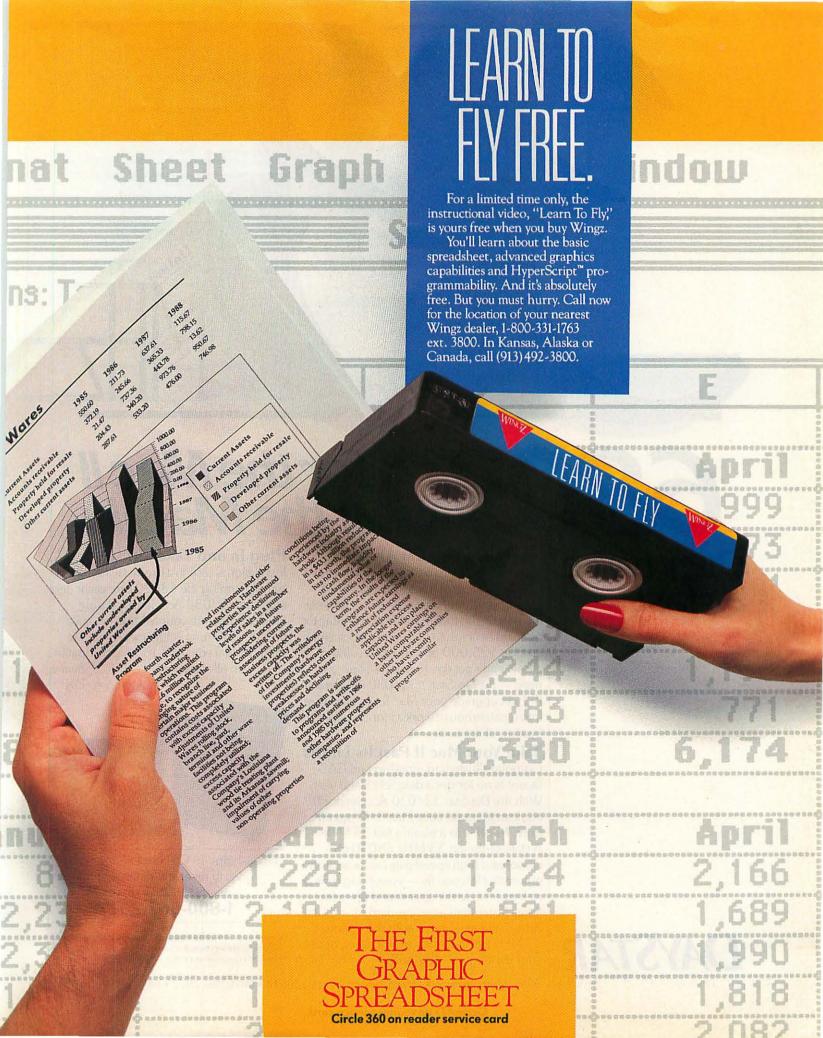
PARACOMP

Paracomp, Inc. 123 Townsend Street, Suite 310 San Francisco, CA 94107, 415-543-3848

Swivel 3D is a trademark of Young Harvill/VPL Research, Inc. Other brand and product names are trademarks or registered trademarks of their respective holders.

THIS IS WAY TOO EASY. UNSURPASSED NUMBER-CRUNCHING POWER. CHARTS SO GRAPHIC, THEY JUMP OFF THE SCREEN INTO PAGE PERFECT PRESENTATIONS. YOU'RE ACTUALLY LOOKING FORWARD TO YOUR NEXT MEETING. BECAUSE YOU'RE NOT JUST GOING TO SHOW THEM NUMBERS. YOU'RE GOING TO WIN THEM OVER WITH WINGZ."







68030 for the Mac II

Over twice as fast

Step a Generation Ahead

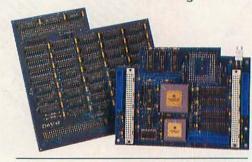
Powerful new Macintosh™ software needs a new generation of hardware. Advanced graphics and engineering software now has the potential to make your Mac II or Mac IIx perform better than high-end workstations costing \$25,000 or more. But software alone won't get you the workstation you need — the DayStar™ 33/030 Accelerator II™ will upgrade your Mac II/IIx hardware into a powerhouse workstation, and at a fraction of the cost.

Take Your Mac II Past Its Limits

Complex illustrating, drawing and CAD layout is no longer a drag, click and wait. With the DayStar 33/030 Accelerator II you can increase your Mac II/IIx speed from 16 MHz to a blazing fast 33 MHz. A state-of-the-art 33 MHz 68030 processor and high speed data cache adds the power that lets you fly — everything runs at well over twice the speed, and up to four times faster than your standard Mac II/IIx. Kick in the afterburner with the optional 33 MHz 68882 math coprocessor, or use your existing 16 MHz 68881.

Plug In and Take Off

Installation is easy, just like installing SIMMs. Simply unplug the 68020 processor and plug the 33/030 Accelerator II right in. Don't change your SIMMs because the 33/030 runs at full speed with the memory that you have. It's fully compatible with all standard Mac II/IIx software, including A/UXTM.



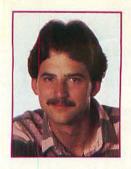
Now shipping! Call our toll-free hotline today to receive the name of the nearest DayStar dealer.

1-800-962-2077

Other brands and product names are trademarks or registered trademarks of their respective holders. Product specifications are subject to change without notice. ©1988 DayStar Digital, Inc.



5556 Atlanta Highway • Flowery Branch Georgia 30542 • (404) 967-2077 • FAX (404) 967-3018



Quick Tips

Answers to your questions

by Lon Poole

You can hush a Mac II by replacing the fan in its power supply with a fan that outputs less air, as I mentioned last January. However, Akbar Paydar, a senior mechanical engineer in Apple's design analysis department, has since cautioned that it's not enough to compare the unrestricted airflow of different fans. Installed inside a Mac II, a fan must overcome resistance caused by the closed cabinet and by cards and disk drives inside. If the fan motor is too weak. the fan will slow down too much and not maintain sufficient airflow. (Two bike riders may be able to maintain the same speed on a flat road with no wind, but the stronger rider can maintain speed going up a steeper hill or facing a stronger headwind.)

Paydar warns that inside a Mac II, even small changes in the fan speed can significantly reduce the longevity of chips on the logic board, the internal disk drive, and other components. He says Apple carefully researched the average and worst-case cooling requirements of the Mac II before choosing a fan, and Apple knows how much noise the fan makes, and continues to look for quieter, adequate solutions. (Warning: Replacing the fan will void the manufacturer's 90-day warranty and may void your AppleCare agreement, if you have one. Replace the fan entirely at your own risk.)

Airflow is measured in cubic feet per minute (cfm), and motor power is rated in amps. Apple's Panaflo-brand fan has a 0.45-amp motor and outputs 39 cfm. A \$15 Radio Shack replacement (catalog number 273-243A) has as 0.19-amp motor and outputs 27 cfm. ComputerWare (415/496-1003, 800/235-1155, or 800/323-1133 in California) sells a \$49 Panaflo replacement with

Lon Poole answers readers' questions and offers advice in bis monthly Macworld column. Many of the tips he's compiled can be found in his book Mac Insights (Microsoft Press, 1987) and in the more recent HyperTalk (Microsoft Press, 1988).

installation instructions that has a 0.19-amp motor and outputs 32 cfm. If you decide to install a replacement fan, Brian Smythe, hardware manager at ComputerWare, suggests maximizing air throughput by means of a chimney effect by standing the Mac II on end, fan end up, with provision for air space on the bottom.

ImageWriter Jam
The ImageWriter II at my office has a small black plastic device that fits around the left end of the platen. A wire attached to it appears to be some sort of ground. This contraption continuously mangles my printing and makes using ThunderScan a real hassle. My own ImageWriter II at home does not have this growth. What does it do

Scott A. Hawk Warminster, Pennsylvania

and why is it bothering me?

You've identified part of the mechanical sensor that detects whether there's paper in the printer. The mechanical paper-out sensor can indeed cause paper jams. Newer ImageWriter II and ImageWriter LQ printers have optical sensors that don't require the black plastic part and don't cause jams. An Apple dealer can replace the mechanical paper-out sensor with the optical style. The parts cost about \$10; labor will probably run between \$40 and \$50.

An optical sensor may not work properly on an ImageWriter whose platen has become shiny from accumulated ink and paper deposits (lint). A dirty platen may reflect light the way a piece of paper does, whereas a clean platen does not. If the ImageWriter keeps printing after the paper runs out, replace the platen or clean it with a solvent such as Fedrol.

Incidentally, an optical sensor doesn't work with plain transparent film, because

the sensor sees the black platen through the transparency. Use transparent film with a white paper backing.

LaserWriter Downgrade
I recently had my LaserWriter upgraded to a LaserWriter Plus. The test page now prints "LaserWriter Plus" instead of "LaserWriter," but shows a 2.0 where it used to show a 3.0. Do I have PostScript version 47? What are the advantages of version 47?

Thomas E. Burke Bryan, Texas

The 2.0 corresponds to PostScript version 38 and the 3.0 corresponds to PostScript version 47. Apparently your LaserWriter had the newer version but the upgrade kit that was installed in it had the older version. Your printer was probably built after October 1987, when Apple switched versions. The upgrade kit was probably built before that date and sat in inventory until you got it.

Apple claims that version 47 constructs fonts up to 25 percent faster and processes bitmapped images up to 40 percent faster than version 38. So take your LaserWriter back to the place that "upgraded" it and insist that the version 47 upgrade kit be installed.

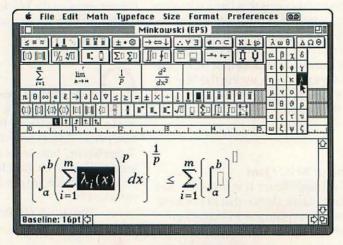
Boosting Network Performance

I represent a company in Spain that has an AppleTalk network with a Mac II, a Mac Plus, and a 2-megabyte Mac 512K. We use the MacServe file server with a 40MB hard disk on the Mac II. When we do

MathType 2.0

Equations for Word Processing

If you need an easy way to create technical reports, slides, class notes, research papers, or even entire books, then MathType is the tool you've been looking for. It's an intelligent equation editor for the Apple Macintosh or for IBM PCs and compatibles that lets you build up complex equations using simple point-and-click techniques ...



Import the finished equation into your word-processing document, and get publication-quality results like this ...

$$\left\{ \int_{a}^{b} \left(\sum_{i=1}^{m} \lambda_{i}(x) \right)^{p} dx \right\}^{\frac{1}{p}} \leq \sum_{i=1}^{m} \left\{ \int_{a}^{b} \left[\lambda_{i}(x) \right]^{p} dx \right\}^{\frac{1}{p}}$$

MathType 2.0 has all the highly-acclaimed features of earlier versions, and some important new ones, too:

- Automatically applies the rules of mathematical typesetting
- Encapsulated PostScript (EPS), Pict, and TIFF output
- Optional T_EX, Mathematica, Excel, Lotus 1-2-3 interfaces
- · User-defined palettes and expression macros
- Runs as a DA on the Mac, under MS Windows on the PC
- Fractional type sizes and positioning to 1/32nd of a point
- On-line context-sensitive Help system
- Fast keyboard access to all symbols, templates, and expressions

All this, and much more, and the price is still only \$149. Call or write for a FREE brochure and working demo disk.



6475-B East Pacific Coast Highway, Suite 392 Long Beach, CA 90803 • (213)433-0685

Circle 165 on reader service card

How To/Quick Tips

a report using the Omnis 3 Plus database manager, it ties up the file server. How can we increase the speed and capacity of the network?

> Juan C. Aeschmann Los Altos, California

The answer to this question comes from Dave Kosiur, a *Macworld* contributing editor, who publishes and edits *Connections*, a newsletter about Macintosh networks (for subscription information, call 714/738-1492).

Kosiur says you can improve network performance by replacing MacServe with a faster file server. Kosiur finds that the TOPS file server from TOPS (415/769-8700 or 800/445-8677) is about three times as fast as MacServe, and it costs only \$249 per Mac. At \$799 per network, Apple's Apple-Share file server is a bit faster than TOPS but requires an extra Mac to be used as a dedicated file server.

You can also speed up a network by increasing data-transmission speed. Two new products claim to accelerate data-transmission speed by as much as two or three times when you use standard LocalTalk or PhoneNet cabling. FlashBox from TOPS and DaynaTalk from Dayna Communications (801/531-0600) are both small, \$189 adapter boxes. You connect one to the printer port of each Mac you want operating at the higher speed and connect the LocalTalk or PhoneNet wiring to the adapter boxes.

If your network has multiple Mac IIs or Mac SEs, you can boost data transmission speed three to five times among them by using EtherTalk—an AppleTalk network running on Ethernet cables. Each Mac connected to an EtherTalk network must have a \$700 Ethernet adapter card installed, and the Macs on the EtherTalk network must be wired together using Ethernet cable. You can connect other Macs using LocalTalk or PhoneNet wiring and interconnect that network with the EtherTalk network using a bridge, such as the \$2495 FastPath from Kinetics (415/947-0998).

Fonts for LaserWriter HSC and ImageWriter LQ

Does anyone sell fonts in large sizes for best-quality printing on a LaserWriter IISC? *Ted H. Gordon San Rafael, California*



Why do so many Mac II Owners Choose National?

Because National memory expansion cards give them:

1. Top A/UX performance

Apple + A/UX [™] + National adds up to a powerful workstation. One that gives them the highest performance for their memory-hungry A/UX applications.

What applications do you have in mind? Software development, CAD/CAM, high resolution graphics, large databases, or multiuser applications? The NS8/16 memory expansion card has the power to unleash your creativity.

2. Up to 16 Mbytes of memory in a single NuBus slot

1MB RAM chips to save power consumption and card slots.

And they're 100ns chips to give top performance. Your applications will run dramatically faster.

Your Mac II™can hold up to five NS8/16's, for up to 80 Mbytes of RAM.

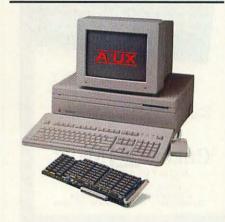
3. Full A/UX Compatibility

The device driver is included. A/UX uses the NS8/16 as system memory so all of your A/UX programs will run without any modification.

Also included is software that allows the expanded memory to be used as a RAM disk in the standard Mac operating system.

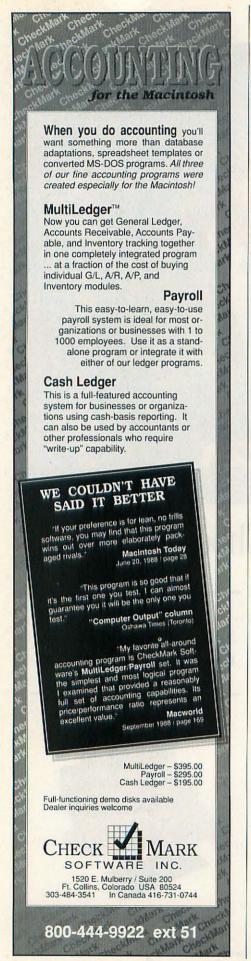
You get a full five-year warranty and support from the leader in add-in products for the Mac II. Join the satisfied Mac II users who have chosen National memory expansion cards

Call today 1-800-538-8510 (in California 1-800-345-4006)





Compatible Products Group Tel: 408-562-4719 Macintosh, Mac II, and A/UX are trademarks of Apple Computer Inc.



Printed Font Sizes		Font	
LaserWriter IISC (4:1)	ImageWriter LQ (3:1)	ImageWriter I & II (2:1)	Size Needed
	6	9	18
5		10	20
6	8	12	24
7		14	28
	9		27
	10	15	30
9	12	18	36
10		20	40
	14	21	42
	15		45
12	16	24	48
	18	27	54
14		28	56
15	20	30	60
18	24	36	. 72
24	32	48	96

Font Reduction
This table shows the size of the bitmap font that must be installed to get a particular actual size when printing best quality using any of these Apple printers. The most commonly used sizes appear here in boldface print. Fractional sizes bave been omitted.

A number of companies make bitmap fonts in a full range of sizes from 9-point to 96-point. You can use the large sizes for best-quality printing in popular sizes between 9- and 24-point on a LaserWriter IISC. As you may know, the LaserWriter IISC achieves its 300-dotsper-inch resolution by printing fonts onefourth their nominal size. For example, a 96-point font prints at 24-point, Along with the LaserWriter IISC font sizes, most companies include sizes for best-quality printing on an ImageWriter LO, which prints fonts one-third their nominal size. Many of the LaserWriter IISC and ImageWriter LO font sizes can also be used for best-quality printing on an ImageWriter I or II, both of which print fonts half size. The table "Font Reduction" correlates various sizes of installed bitmap fonts with actual printed font sizes using these Apple printers.

Bitstream (800/522-3668 or 617/497-6222) has bitmap versions of all 35 PostScript fonts—11 font families—that are standard on a LaserWriter IINT. Called SoftFonts, they come in sizes for best-quality printing on the LaserWriter IISC and

ImageWriter LQ. You can get a bitmap version of Garamond in large sizes from Casady & Greene (408/646-4660).

Modem to Mouthpiece

Tip: Travelers, students, and office workers who want to use their Macs with modems all face a common problem if their hotel rooms, dormitories, or offices have telephones without modular connections. All modems that operate at a reasonable speed—1200 baud or faster—require modular connections. You can resolve this problem by connecting the modem to the mouthpiece of a standard telephone handset.

If you unscrew the mouthpiece and remove the microphone from the handset of a standard telephone, you see two metal prongs. You can make a cheater cable to connect the prongs in the handset to the modular RJ11 jack on the modem: you need a standard modular line cord with RJ11 connectors at each end (not a curly handset cable), two miniature alligator clips, a soldering iron, and some solder. Cut the line cord into two pieces. Next carefully remove a couple of inches of the outer plastic casing from the cut end of one of the pieces, exposing four colored wires. Then strip the insulation from the red and green wires

10 reasons why you should switch to New Turbo Mouse.

Fly across even the biggest screen with automatic acceleration. Turbo Mouse® senses the speed at which you're working and moves the cursor further when you move faster.

No rolling room required. With the Turbo mouse ball on top, you move only the ball, not the whole mouse.

Turbo Mouse offers a second mouse port. Turbo Mouse ADB offers a second ADB port.

Perform one of seven functions—Save, Print, Open, Close, New, Quit, or Undo when you click both buttons at once. (Only in Turbo Mouse ADB.)

Three times as ______ precise as a mouse. New patented "optical levering" technology offers 200 CPI pin-point precision.

One button is for regular clicking, the other is a click lock. You choose which is which.

5 Advanced two-button design allows for either right or left-handed use!

Only 4" by 6", Turbo

Mouse fits neatly beside
any Macintosh® or Apple IIGs®
keyboard.

Turbo Mouse ADB, #62360, works with Mac SE, Mac II, or Apple IIGs. Turbo Mouse, #62358, works with Mac or Mac Plus. Both have a suggested retail of \$169.95.

10 It's easy to find. For a Turbo Mouse dealer near you, just call 1-800-535-4242, or 212-475-5200.

KENSINGTON 🔷

Circle 192 on reader service card

How To/Quick Tips

MAC IMAGE PROCESSING THAT MEASURES UP

SCIENTIFIC • MEDICAL • DEFENSE RESEARCH • INDUSTRIAL

- Mac II application for image capture, enhancement and analysis with either frame grab or PICT and TIFF image files.
- Feature extraction, gray scale, edge, vectors, area, convolution and morphology are a few techniques.
- Distance and location measurements in REAL WORLD units.
- Three levels of user interface:
 - Click and drag for over 70 image analysis and measurement tools. Interactive and automatic sequencing.
- MacRAIL™ Developers Kit –
 An interpretive language to add your own algorithm or access our extensive imaging library. Easy interface to Apple graphical presentation format.
- C Libraries For the professional imaging programmer.

IMAGE PROCESSING WORKSHOP

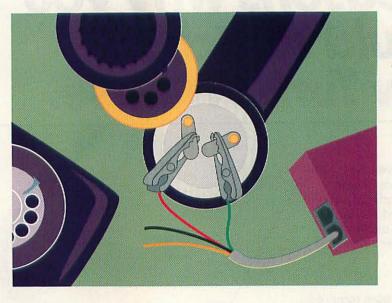
Introduce concepts and terminology in a hands-on clinic. Participants will set up and implement practical applications using a menu driven package. \$1,100 / student; 3 days





Call for our Technical Summary Package 508-667-7900 1000 Tech Park Drive, Billerica, MA 01821

Circle 428 on reader service card



Modular Bypass
If you don't have access to a modular wall
jack, you can attach
the red and green
wires of a line cord to
the prongs inside the
mouthpiece of most
telephone handsets.

and solder each to an alligator clip. The yellow and black wires are unused.

To use your cheater cable, attach the alligator clips to the handset prongs and plug the modular connector into the modem, as shown in "Modular Bypass." If the phone line is touch-tone compatible, proceed as if the modem were connected to a modular wall jack. Even if you tap into a rotary dial phone, its phone line may be able to handle touch-tone signals from the modem.

If the phone line requires rotary (pulse) dialing, then you must dial the number manually with the telephone. Using a communications application that lets you type commands to the modem (Microphone, Red Ryder, FreeTerm, and others), type the command ATH1 to take the modem off-hook. Be sure to type all capital letters for modem commands. Take the phone handset off the cradle and use the phone to manually dial the number you want to reach. If the modem has a speaker, you will hear it echo the pulse sounds of dialing. As soon as you hear the carrier tone from the remote computer, type the command ATO (that's the letter O, not a zero) to put the modem online. Now you're connected.

If you don't want to bother with soldering and alligator clips, you can buy the \$49.95 Black Jack connector manufactured by Digital Systems International (206/881-7544). It temporarily replaces the mouthpiece with a modular jack, so you can attach a modem using a standard mod-

ular line cord. Digital Systems claims to have sold over 23,000 of them worldwide. *Richard P. Adams Yellow Springs, Ohio*

You can dial manually with AppleLink, MacNet, and CompuServe Navigator, all of which normally automate the dialing process. Simply set the phone number that the application dials automatically to a capital O. In AppleLink, for example, you set the phone number using the Setup command in the Network menu. Then dial the number manually using the phone and immediately initiate the standard connect procedure in the application. Again in AppleLink, choose Connect from the Network menu, type your password, and click on the Connect to Network button.

I tried this technique with several different phones, and it worked with all but one of them.

Numbered Names in Order

ate similar file and folder names, those names may not be arranged as you'd like in the Finder's By Name view or in Open dialog boxes. For example, the name Q10 appears between Q1 and Q2, not following Q9. To work around this problem, put a space before the digit in names with single-digit numbers, and no space before the digits in names with two-digit names. This strategy makes Q10 follow Q9, not Q1, for example. If some names have three-digit numbers, you must prefix single-digit numbers with two spaces, two-digit numbers

Leader of the Mac!



The Experts Agree:

FoxBASE + /Mac's New Version 1.10 is the Ultimate Relational Database Management System for the Macintosh!

Don Crabb, InfoWorld, July 11, 1988:

"FoxBASE+/Mac proved to be as easy to use as any Mac relational database we've tested."

Macworld, September, 1988:

"FoxBASE+/Mac deserves serious consideration as both a stand-alone database product and a connectivity solution."

Richard Skrinde, MacUser, September, 1988:

"FoxBASE+/Mac is a racehorse that will outrun the other Macintosh databases."

Arthur Fuller, Computing Canada, June 9, 1988: "So phenomenally great that it justifies the purchase of a Macintosh just to run it!"

Michael Masterson, MacWEEK, June 7, 1988:

"FoxBASE+/Mac proves beyond a doubt that the Mac is a suitable platform for supporting fast database operations." **BYTE**, September, 1988:

"FoxBASE+/Mac combines dBASE compatibility with a strong list of features and a work environment with which

Charles Seiter,, Macworld, October, 1988:

Mac users will feel comfortable."

"It's the fastest general purpose Mac database, often ten to a hundred times faster than its competitors."

FoxBASE+/Mac Version 1.10 includes everything you love about the original FoxBASE+/Mac PLUS a new form generator, an outstanding application generator and a complete template language system—all designed to save you time and effort! Now you can develop complete database applications in just minutes!

And now Fox Software introduces FoxBASE+/Mac Multi-User, leading the industry with the ultimate in data sharing — concurrent data access! For the first time, networked Macs and PCs can simultaneously share the same data files!* In addition, FoxBASE+/Mac Multi-User supports an unlimited number of users on your network.

Even with all these enhancements, Version 1.10 doesn't cost any more — it's still only \$395! And our new Multi-User is just \$595!

FoxBASE+/Mac earned an exceptional 7.0 rating on *InfoWorld's* Software Review, and a 4.5 rating on *MacUser's* scale. It's the one Mac database system that has it all!

Join the experts NOW! Contact your local quality software dealer, or order your copy of FoxBASE+/Mac by calling (419) 874-0162, Ext. 650. Free demo package available.

Why be a follower when you can go with the leader!

Fox Software

Nothing Runs Like a Fox.

Fox Software 118 W. South Boundary Perrysburg, OH 43551

(419) 874-0162, Ext. 650 FAX: (419) 874-8678 TELEX: 6503040827 FOX

Circle 152 on reader service card

^{*} Requires a copy of FoxBASE+/LAN, our PC multi-user software, on the network file server. FoxBASE+/Mac and FoxBASE+/Mac Multi-User are trademarks of Fox Software. dBASE is a trademark of Ashton-Tate. Macintosh is a trademark of Apple Computer, Inc.

AFTER THE DECLARATION OF INDEPENDENCE OUR FOUNDING FATHERS WROTE SOMETHING EVEN MORE IMPORTANT.

Ten years after the signing of the Declaration of Independence our founding fathers created what historians have called the greatest single document struck off by the hand and mind of man.



Our founding fathers created the Constitution of the United States.

For the first time in history, power was granted by the people to the government, and not by the government to the people.

The freedom unleashed by the Constitution allowed Americans to develop their talents and abilities to the fullest. And attain what is now known the world over as the American Dream.

As we commemorate the Bicentennial of the Constitution, there is no better way for you as an American to reaffirm the principles for which our country stands than to learn more about the Constitution.

The words we live by.

THE CONSTITUTION The words we live by

To learn more about the Constitution write: Constitution, Washington, D.C. 20599. The Commission on the Bicentennial of The U.S. Constitution.

How To/Quick Tips

with one space, and three-digit numbers with no space.

Peter Ansin Santa Monica, California

Hiding the HyperCard Pointer

Tip: If you'd like to hide the pointer while using HyperCard's Browse tool, press the slash (/), asterisk (*), plus (+), or minus (-) key on the numeric keypad.

Tim Cushing El Paso, Texas

All other keys have the same effect if the User Level property is less than 5 (Scripting) or if that property is 5 and the Blind Typing property is true. But for the four keys you've mentioned, HyperCard always acts as if Blind Typing were true.

Parallel Lines

Tip: When you need to place parallel lines close together in Cricket Draw, Illustrator, or FreeHand, it's hard to avoid overlapping them. They look OK on screen but print as one thick line. Instead of using two lines of identical thickness, superimpose a thin white line over a thicker black line. For example, draw a thick black line, copy it, paste it exactly over the original, and change the copy to a narrow white line. To get parallel dashed lines, overlay a thick patterned line with a thin white line.

Peter Breis Artarmon, NSW, Australia

This technique also works in MacDraw II. A variation of it lets you create lines thinner than 1 point—not normally possible in MacDraw II. For that effect, cover one edge of a black or patterned line with a white line.

We pay from \$25 to \$100 for tips published here. Send tips or questions (include your address and phone number) to Quick Tips, Macworld, 501 Second St., San Francisco, CA 94107. Send electronic mail to CompuServe (70370,702) or MCI Mail (addressed to Macworld). All published submissions become the property of Macworld. □

Choose one of these two sets... only \$4.95!

as your introduction to the SMALL COMPUTER BOOK CLUB

You simply agree to buy three more books-at handsome discounts-within the next 12 months



an \$88.85 value—



PROGRAMMING WITH MACINTOSH PROGRAM-MER'S WORKSHOP by Joel West—Create applications and desk accessories using techniques like MPW's line-oriented command interpreter, integrated full-screen windowing editor, and more. Publisher's Price: \$29.95

HOW TO WRITE MACINTOSH SOFTWARE: 2nd Edition by Scott Knaster—Allocate memory, debug with object-oriented approaches, use the "jump" table, get around Pascal's type checking, and more. Publisher's Price: \$28.95

ENCYCLOPEDIA MAC ROM: A Complete A–Z Reference for Macintosh Toolbox and Operating System Routines by Keith Mathews and Jay Friedland —This one-stop reference brings you 718 alphabetically arranged routines from the Macintosh ROM. Publisher's Price: \$29.95

SMALL COMPUTER BOOK CLUB is a division of the Library of Computer and Information Sciences, the oldest, largest and most respected computer book club in the world. Unlike other microcomputer clubs, Small Computer Book Club offers books from a wide variety of leading publishers.

MEMBERSHIP BENEFITS • In addition to getting the set of your choice for only \$4.95 when you join, you keep saving substantially on the books you buy. • Also, you will immediately become eligible to participate in our Bonus Book Plan, with savings of 65% off the publishers' prices. • At 3-4 week intervals (16 times per year), you will receive the Small Computer Book Club News, describing the coming Main Selection and Alternate Selections, together with a dated reply card. • If you want the Main Selection, do nothing, and it will be sent to you automatically. • If you prefer another selection, or no book at all, simply indicate your choice on the card and return it by the date specified. • You will have at least 10 days to decide. If, because of late mail delivery of the News, you should receive a book you do not want, we guarantee return postage.

MACINTOSH USER'S LIBRARY

-an \$89.85 value-

D CIDADA DE ::



THE FULLY POWERED MAC by Robert Eckhardt— Tips, strategies, and public-exchange programs for installing Fkeys, adding your signature to PostScript fonts, changing arrangement of icons and lists, automating start-up routines, and more. Includes a disk. Publisher's Price: \$39.95

MACINTOSH HARD DISK MANAGEMENT by Bencion J. Calica and Charles A. Rubin—Tips, techniques, and hints on file organization, backup, HFS directories, and print spoolers that help you speed print. Publisher's Price: \$1995

THE COMPLETE HYPERCARD HANDBOOK: 2nd Edition by Danny Goodman—Features easy-to-use development tools that let you create your own information-based applications with backgrounds, cards, fields, and buttons. Publisher's Price: \$29.95

Call 1-800-888-4843 to join now!

Small Computer Book Club

Riverside, New Jersey 08075

Please accept my application for trial membership and send me the set indicated below billing me only \$4.95, plus shipping and handling. I agree to purchase at least three additional Selections or Alternates over the next 12 months. Savings range up to 30% and occasionally even more. My membership is cancelable any time after I buy these three additional books. A shipping and handling charge is added to all shipments.

Check the set you want:

☐ Macintosh Programmer's Set (00949)
☐ Macintosh User's Set (00950)

No-Risk Guarantee: If I am not satisfied—for any reason—I may return my introductory set within 10 days. My membership will be canceled, and I will owe nothing.

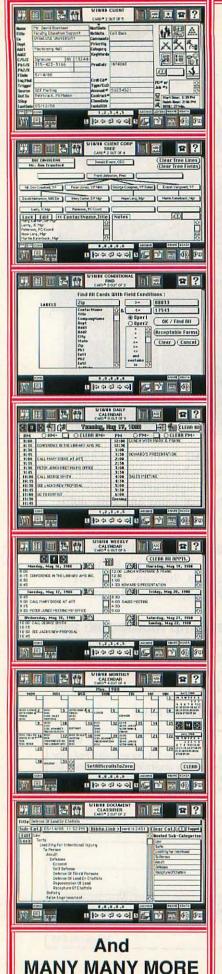
Name_____Address_____Apt.__

City____

(Books purchased for professional purposes may be a tax-deductible expense. Offer good in Continental U.S. and Canada only. Prices slightly higher in Canada)

Macworld 4/89

Y-CD9



HYPER-ACTIONTM

THE PROFESSIONAL INFORMATION MANAGER

THE ULTIMATE SALES, CONTACT, ACTIVITY, TIME, & RELATIONSHIP MANAGER

ALL STACKS: COMPLETELY LINKED A COMMON INTERFACE FOR ALL ACTIVITIES

MAKES C.A.T.TM LOOK LIKE A MOUSE MAKES FOCAL POINTTM LOOK DULL

THE MOST INCREDIBLE
TOTALLY INTEGRATED
HYPER RELATIONAL APPLICATION

PARTIAL FEATURE LIST =

• All Code Written In HyperTalkTM • Automatic Indexing Of All: Associates, Clients, Companies, Documents, Letters, Memos, Notes, Personnel, Pictures, Pitches, Products, Prospects, Relationships, And More • Automatic Monthly Sales Projections By: Client, Company & By Product Line • Automatic Archiving Of Any Card: (Lead, Prospect, Client, Etc.) • Automatic Bibliography And Note Links • Automatic Conversation • Timer & Posting To Client: Time Billing Order • Automatic Formatting & Posting Of Letters • Automatic Hierarchical Document, Notes, & Picture Classification • Automatic Letter Generation & Maintenance Of A List Of Letter Recipients By Letter • Automatic Morning Activity Status Reporting Of: Yesterday's To Do, Today's To Do, Yesterday's Staff To Do, Today's Staff To Do • Complete Client & Prospect History • Direct Mail Management • Export Tab Delimited Files • Find (Multiple Arguments), Find All, Find Conditional (EXTENSIVE BOOLEAN Searches) • Global Data Insert • Global Data & Person Searches • Import Tab or Comma Delimited Files • Mailmerge • Maps (Over 100 State, World, City & Highways) • Mass Mailing Tracking • Merge Any Two Stacks By Field • Mini Corporate Tree • Mini Outliner • Multiple Alarms: Audible & Physical, AnyWhere & Any Time • Multiple Field Searches • Multiple Word Searches • No Copy Protection • On-Line Help (EXTENSIVE) • Post All Calendar Events From Daily To Weekly To Monthly • Sales Reports • Sorts On Any Field OR Any Combination AND/OR Number Of Fields Simultaneously • Sticky Notes Any Time or Place • To Do & Staff To Do: Posting By Date & Staff Member • User Extendable Without Limit • Write Only Once • AND MUCH MUCH MORE!!!

The Complete Personal, Office, & Sales Management System

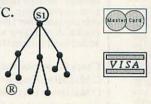
Personal Productivity - Office Management - Direct Mail - Sales Tracking & Management Subsets

\$94.50

ABSOLUTELY THE GREATEST VALUE EVER!!!

CALL NOW 1-800-888-HYPE

MULTI SOLUTIONS, INC. 123 Franklin Corner Rd. Lawrenceville, NJ 08648 609-896-4100 Fax # 609-895-0072 Telex # 821073



Requirements: Apple Macintosh™ Plus, or SE, or II, Hard Disk Recommended; HyperCard™ 1.2.2 Supplied with HYPER-ACTION™! HyperCard™ & HyperTalk™ & Macintosh™ are Trademarks of Apple Computer, Inc.; C.A.T.™ is a registered trademark of Chang Labs., Inc., FOCAL POINT™ is a registered trademark of Actavision, Inc.





Getting Started with Expansion Slots

A survey of expansion options for the Mac SE and the Mac II

by Jim Heid

Expansion slots make a computer more versatile and provide insurance against obsolescence. These internal receptacles for optional expansion boards open the Mac to a world of hardware options, from large-screen video monitors to high-speed processors, to music and networking boards.

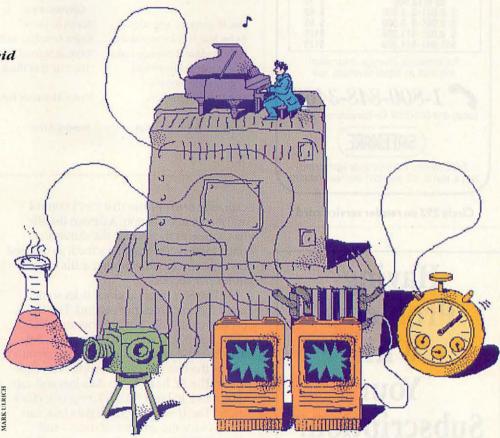
But some people believe that slots create compatibility problems and are intimidating and inconvenient. Design a computer right to begin with, they say, and slots are unnecessary.

You wouldn't expect a plastic connector and a few dozen polished pins to create controversy, but in the early days of the Mac's gestation, the debate over whether or not to give the Mac expansion slots was a furious one. The original Mac eventually debuted with a sealed case and little hope for internal expansion. Were it not for its ease of use, it might have died a quick death at the hands of the IBM PC—which, like most personal computers, has slots.

Why the fuss over expansion slots? After all, you can plug add-ons into the Mac's external modem, printer, and SCSI ports. What do slots offer that the Mac's ports don't?

A great deal. This month, we journey inside the case to look at how the slots in the Mac SE and the Mac II work, and at what's available to fill them. "Recom-

Jim Heid is a Macworld contributing editor who each month focuses on a different aspect of Mac fundamentals. He is at work on an advanced user's guide for the Mac, to be published this year by Brady Books.



mended Reading" lists some past *Mac-world* articles that discuss expansion-related topics.

This Bus Is Never Late

To understand the benefits of slots, you need to understand the *bus*—an internal freeway that carries data between the Mac's memory, its microprocessor, and a variety of support chips—bit players that perform small but vital roles in the Mac's operation. Some of these support chips act as intermediaries between the bus and the Mac's external ports.

All Macs contain two primary buses: the *address bus*, which carries signals

from the microprocessor that specify where in memory data is to be stored or retrieved; and the *data bus*, which carries the data itself. With only a few exceptions, all the data that moves within the Mac does so on its data bus. Thus, the speed of the bus plays a major role in determining the Mac's overall performance.

Just as only one vehicle at a time can squeeze through a toll booth, only one component in a Mac can use the bus at any given time. A device gains access to the bus by sending signals on one of several spe-



When your surge protector fails will your insurance save you? SAFEWARE computer insurance covers power surges, lightning, theft, fire, accidental damage and more! Full replacement of hardware, media and purchased software for as little as \$39 per year.

Total Value, Hardware, Media & Purchased Software	Annual Premium
up to \$2,000	\$ 39
\$ 2,001-\$ 5,000	\$ 69
\$ 5,001-\$ 8,000	\$ 89
\$ 8,001-\$11,000	\$109
\$11,001-\$14,000	\$129

For immediate coverage, information and rates on higher coverages, call





SAFEWARE, The Insurance Agency Inc. 2929 N. High St., P.O. Box 02211, Columbus, OH 43202

Circle 293 on reader service card

Having Problems With Your Subscription?

Please let us know.

Phone toll-free 800/525-0643. From Colorado, Alaska, Hawaii and outside the U.S., please phone 303/447-9330.

How To/Getting Started

For Information On	See	Issue
NuBus slots	"Approaching the Mac II"	June 1987
Mac II color monitors	"Chasing Rainbows"	July 1987
Mac SE accelerator boards	"Beefing Up the SE"	September 1987
Ethernet expansion boards	"The Ethernet Solution"	January 1988
Upgrades for slotless Macs	"New Life for an Old Mac"	February 1988
Mac-to-VAX networking	"Getting Started with Mac-VAX Connections"	March 1988
Mac II memory upgrades	"Room to Grow"	March 1988
24-bit Mac II color monitors	"Color Graphics in Bloom"	April 1988
How the Mac II displays color	"Getting Started with Color"	May 1988
Mac II monochrome and gray-scale monitors	"The Mac II in Black and White"	May 1988
Mac II color monitors	"Color Monitors Revisited"	August 1988
Expanding the Mac Plus	"Staying Alive"	August 1988

Recommended Reading

For more information on expansion-related topics, consult these previously published Macworld articles.

cialized *control lines* that carry control and status information. A device usually has access to the bus for the duration of one *clock cycle*—one heartbeat as defined by a quartz crystal vibrating millions of times per second.

The SE's internal clock ticks some eight million times per second. The II is faster than the SE, not only because its clock hums at about twice that pace, but also because of its bus width—the number of bits the bus can carry during one clock cycle. The SE has a 16-bit data bus and can thus move 16 bits of data during one clock cycle. The II, with its 32-bit data bus, can move twice the amount of data—and thanks to its faster clock rate—in half the time. (Of course, other factors contribute to the II's speed, including its 68020 microprocessor—or 68030, in the IIx—and its more efficient SCSI hard-disk port and video circuitry.)

When Bus Meets Slot

When you consider the significant role the bus plays, the advantages of tapping into it become clear. With direct access to the microprocessor, to memory, and to many of the timing and control signals inside the Mac, a device connected to the bus becomes an integral part of the Mac. Many expansion boards are able to supplement or even supplant the Mac's microprocessor with their own—more about that later.

Another advantage is speed. A device connected directly to the bus can transfer data and communicate with memory far faster than it could using one of the Mac's external connectors. In an SE, the SCSI port transfers data at about 656,000 bytes per second; a board in the SE's expansion slot can access memory at over 3 million bytes per second. Yes, there's always a benefit to eliminating the intermediary.

Before the SE and the II arrived, attaching a device directly to the bus required some devious hardware designs. To shoehorn internal hard disks into early Macs, pioneering Mac hardware manufacturers such as Levco and GCC Technologies (formerly General Computer) accessed the bus by attaching a large clip to the 68000 microprocessor. But the clip's contacts could loosen or corrode over time, causing unreliable operation. Some modifications complicated servicing and voided Apple's warranty. And the extra circuitry could overload and overheat the Mac's fanless power supply.

Slots solve all that. If the bus is a freeway, then a slot is a set of on and off ramps, ready to accommodate high-performance add-ons without clips, voided warranties, or fried power supplies.

Stop the presses.

DirectPrint[™] is here: \$3495*

You have to see it to believe it.

Fast, efficient, and crystal clear. The DirectPrint non-impact page printer uses liquid crystal shutter technology to produce stunning results at an amazingly low price.

Covering both ends of the spectrum, DirectPrint gives you deep velvet blacks on graphic images as well as sharp readable text with clearly visible fine lines.

To stay ahead you have to run faster.

And we do. Depending on the document, our four-MIPS RISC processor (backed by 3 megabytes of RAM) averages speeds five times faster than the competition. Without sacrificing precision quality.

DirectPrint is PostScript*compatible, giving you

unlimited versatility in creating and manipulating text and graphics.

They do it with mirrors. We don't.

Electro-photography with a liquid crystal shutter array enables the DirectPrint to produce exceptional resolution at 300 dots per inch.

Since we do not use rotating mirrors and lenses we don't suffer from scanning distortion. You can expect consistent quality from the middle of the page to the edges.

And with fewer mechanical parts than conventional laser printers, the DirectPrint offers greater reliability.

We won't weigh you down. We wouldn't call it a portable, but at 35 pounds the DirectPrint is light enough to move easily. And with a price of only \$3495, chances are your office is exactly where you will want to move it.

Worldwide doorstep delivery is just a phone call away.

It's easy to order a DirectPrint page printer. We welcome your MasterCard, Visa, and American Express. Dial 1-800-347-3228 in the U.S., 415-282-1111 worldwide.

Our knowledgeable sales staff is on duty Monday through Friday from 8am to 6pm (Pacific Standard Time).



The proof is in the printing.

Jasmine Technologies, Inc. 1740 Army Street, San Francisco, CA 94124 Phone: 415-282-1111 Worldwide. 1-800-347-3228 in U.S. Fax: 415-648-1625



The DirectPrint non-impact page printer works with both Apple and MS/DOS-based systems. Weighing only 35.2 pounds, it is 15.7" wide by 13.4" deep by 9.1" high.

*110 volt model only 220 volt model slightly higher. © 1988 Jasmine Technologies, Inc. DirectPrint is a trademark of Jasmine Technologies. PostScript is a registered trademark of Adobe Systems, Inc.

Equations Made Easy

with

Expressionist 2.0

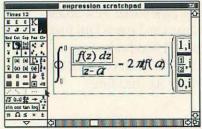
The Personal Mathematical Equation Editor



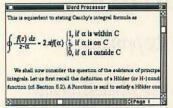
"The Expressionist upgrade has left the others in the dust"

- MacWorld magazine, February 1989

1.) Select the DA ...



2.) Create your equation ...



3.) Copy & paste into your word processor!

and get

Results like this:

$$\nabla^2 \mathbf{E} - \frac{\mu \varepsilon}{c^2} \frac{\partial^2 \mathbf{E}}{\partial t^2} = 0$$
$$\nabla^2 \mathbf{B} - \frac{\mu \varepsilon}{c^2} \frac{\partial^2 \mathbf{B}}{\partial t^2} = 0$$

erfc
$$\left(\frac{|z_1 - z_2|}{\sqrt{2} \sqrt{\frac{1}{N_1 - 3} + \frac{1}{N_2 - 3}}} \right)$$

Send \$129.95 for the complete package, or for a brochure and more information write to:

allan bonadio associates

814 Castro Street #90 San Francisco, CA 94114 (415) 282-5864

Circle 49 on reader service card

How To/Getting Started

Surveying the Slots

The SE contains one expansion slot; the II contains six. The slots in both machines have 96 pins, but the similarity ends there. The SE's slot provides direct access to the SE's internal bus, but it's far less sophisticated than the Mac II's slots.

The Mac II's slots are based on a bus standard called *NuBus*, developed at the Massachusetts Institute of Technology and refined in 1985 by a standards committee comprising representatives from MIT, AT&T, Texas Instruments, Apple, and others. The NuBus standard specifies everything from how expansion boards access the internal bus to such nitties as the distance between the slot's pins.

The Mac II's NuBus slots overcome two of the classic drawbacks of slots: forcing users to fuss with small switches inside the case that tell the computer what hardware they've installed, and making it harder for software developers to write software that runs on different system configurations.

Every NuBus board contains a configuration ROM—a read-only memory chip that identifies the board and describes its capabilities. When you switch on the Mac II, it consults each board's configuration ROM and then sets up your system accordingly. Thus, installation is usually a plugand-play proposition.

Apple tackled the software compatibility problem by designing the Mac's system software to act as an intermediary between application programs and hardware. Properly written Mac programs never access hardware directly; instead, they use Macintosh Toolbox routines, which access the hardware. So as long as software developers follow Apple's guidelines, their programs will run on any Mac, regardless of the boards it contains.

What kind of goodies can slots accommodate? Glad you asked. What follows is a sampling of boards for the SE and the II—not a complete list, but a starting point for your hardware shopping spree.

Speed Thrills

Computer speed is like money: you can't have too much, and most people say they don't have enough. *Accelerator boards* such as the Radius Accelerator, GCC's HyperCharger 020, and Levco's Prodigy 4 boost the Mac's performance by replacing its microprocessor with a faster one. As I write this, I'm being pressed into

the back of my chair by a Radius Accelerator 25, an SE accelerator board boasting a 68020 running at 25MHz—25 million clock ticks per second, versus the stock SE's 8MHz and the II's 16MHz. Like most SE accelerators, the Radius Accelerator is available with a 68881 *math coprocessor*, a specialized microprocessor with a head for math.

Some SE accelerator boards, such as MacPeak's Orion SE, also boost the Mac's main memory. The Radius Accelerator doesn't, but it does contain 32K of cache *memory*—high-speed memory that stores the most recently used data or program instructions and supplies them to the 68020 microprocessor if they're needed again. Why put additional memory on an accelerator board rather than on the SE's main board? Performance, 68020 accelerator boards have 32-bit data buses, versus the SE's 16-bit bus. Thus, the 68020 can access the accelerator board's memory faster than it can the Mac's. And how—the Radius Accelerator 25 has made me impatient with my Mac II.

Not that the II is being ignored. Day-Star Digital, MacPeak, Siclone, and others have announced Mac II accelerators whose 68030 microprocessors run at a blistering 33MHz. Most also contain on-board cache memory. Some, such as MacPeak's Orion II, contain the newer 68882 math chip, which is considerably faster than the Mac II's stock 68881.

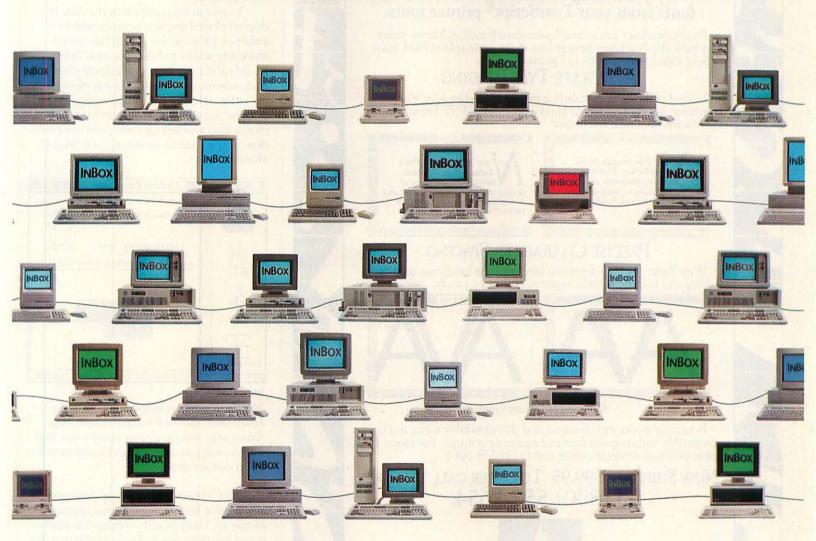
Now See Here

It used to be you could have any kind of Mac screen you wanted, as long as it was black and white and measured 9 inches. That's changed. *Video boards* allow you to tailor the Mac's display circuitry to your needs.

Unlike the SE and other small Macs, the Mac II contains no video circuitry. When you buy a Mac II, you'll also buy a video board. Most Mac II buyers opt for Apple's video board, a capable board that produces up to 256 colors or gray shades. Users of desktop publishing or drafting software, however, may choose a large-screen monitor-and-board combination from such vendors as Moniterm, Radius, E-Machines, or SuperMac. By showing one or two actual-size pages at once, such monitors reduce tedious scrolling and zooming.

For color graphics applications, you might consider one of the new breed of 24-bit color boards. By tripling the num-

When it comes to electronic mail, InBox is TOPS.



InBox, the powerful yet easy to use electronic mail system is now part of the family of TOPS networking products. Which makes InBox the most well-connected E-mail software you can buy.

With InBox electronic mail you can send memos, phone messages, files, outlines — even full-scale reports and spreadsheets — to any InBox user in your company. So, you can share more information and meet less often.

In fact, with the addition of InBox, TOPS now offers a total connectivity solution. Whether you're

using Macs, PCs or any combination, exchanging files, sharing peripherals or sending E-mail messages can all be done easily and transparently. No matter what your needs are, TOPS has the solution.

So either call your nearest InBox dealer or call

us at 800-445-TOPS (or 415-769-8700 from outside the U.S. and Canada). Or write, TOPS, 950 Marina Village Pkwy, Alameda, CA 94501.



Now. Type Imaging That's —Letter Perfect.

FontSizer[™] takes the guesswork out of desktop publishing by creating accurate screen fonts from your PostScript[®] printer fonts.

FontSizer allows you to build a standard Font/DA Mover screen font from any PostScript printer font in any style (plain, bold, italic, or bold italic) at sizes up to 127 point.

ACCURATE TYPE IMAGING

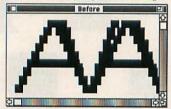
Instead of the crudely scaled bit map produced by your Mac, FontSizer uses your printer to build a precision NFNT bitmap at the full Macintosh screen resolution.

ow. Type Imaging That's
Setter Perfect. FontSizer
takes the guesswork out of
desktop publishing by creating accurate
screen fonts from your PostScript⊕
printer fonts.

ow. Type Imaging That's
Letter Perfect. FontSizer
takes the guesswork out of
desktop publishing by creating accurate
screen fonts from your PostScript®
printer fonts.

PRECISE CHARACTER SPACING

With FontSizer built fonts you can fine tune headlines, drop caps, leading and kerning without repeatedly printing proofs.





96 Point ITC Avant Garde®

FontSizer works with resident and downloadable fonts and is compatible with popular font management utilities. For more information or dealer inquiries call (512) 339-0001.

Now Shipping \$99.95 To order call toll free 1 (800) 552-7654.



Texas residents add sales tax. • VISA, M/C and CODs accepted • FontSizer is a trademark of U.S. MicroLabs Inc. PostScript is a registered trademark of Adobe Systems, Inc. • Macintosh is a trademark of Apple Computer, Inc. ITC Avant Garde is a registered trademark of International Typeface Corporation.

U.S. MicroLabs Inc. • 1611 Headway Circle, Building No. 3 • Austin, Texas 78754

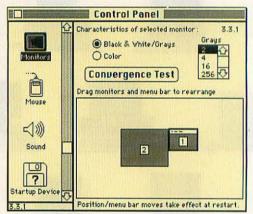
U.S. MicroLabs Inc., A CareAmerica Company

Circle 448 on reader service card

How To/Getting Started

ber of bits assigned to each screen pixel, boards such as Jasmine's Rembrandt II and SuperMac's Spectrum/24 provide direct access to 16.7 million colors. But tread this path carefully, because at this writing, the Mac's system software doesn't support 24-bit color boards. To provide 24-bit color capability, some board makers have *patched* Color QuickDraw, the Mac II's graphics routines. When Apple releases its new Color QuickDraw (which will support 32-bit color), many boards may require software updates.

Unlike many computers, the Mac II doesn't make buying a video board an either-or proposition. The II has the remarkable ability to house several video boards and treat their monitors as one huge screen area—even if each monitor provides different color or gray-scale capabilities. You can drag windows from one monitor to another, or even position a window to span across monitors (see "Mac II Monitors").

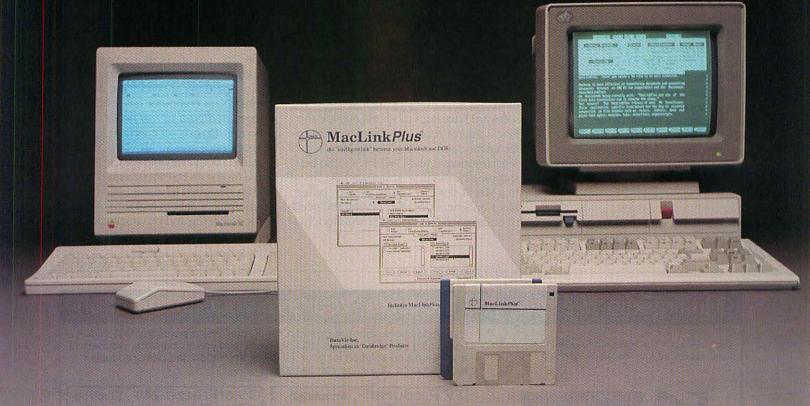


Mac II Monitors

The Mac II can accommodate several video boards and treat their monitors as one huge screen area. You specify how multiple monitors interact using the Monitors option of the Control Panel desk accessory.

As for the SE, its video options generally involve large-screen monochrome monitors. Their boards contain the additional memory needed to hold the bits that represent a large-screen image, and also contain circuitry that speeds the screenpainting process. Many SE video boards include software that lets you use the SE's screen to hold windows or tool palettes—much like the Mac II's multimonitor mode. Radius boards even let you detach menus from the menu bar and keep them on the screen, where their commands are only a click away.

PROOF YOU DON'T HAVE TO BE RICH TO BE WELL CONNECTED



Whatever Macintosh-PC setup you have, MacLink-Plus — at \$195 — provides the very best solution for transferring and translating files and documents between the two.

If you want to connect a single Mac to a PC or laptop, MacLink*Plus* provides everything you need—a direct connect cable (you can use a Hayes or compatible modern if you prefer) and software, including translators, for both the Macintosh and the PC.



If you have a DOS disk drive, then the MacLink*Plus* library of over 40 translators is the solution to accurate conversion of your files.

Formats and styles are retained during the conversion and there's no need to preconvert to ASCII or print files. This library also makes MacLink*Plus* the perfect enhancement to Apple's new Apple File

Exchange utility.

And if you have Macs and PCs on a network or AppleShare server, etc., the MacLink*Plus* file translation capabilities are worth the price alone.

So, if you want to be really well connected, the size of your wallet really doesn't matter. Just call (203) 268-0030 for your nearest DataViz dealer. Because as Macintosh Today recently said, "MacLink*Plus* was one of the first data translators and it remains the champ."

DATA Z

35 Corporate Drive Trumbull, Connecticut 06611

System Requirements: Macintosh Plus, SE and II. All IBM PCs and compatible systems.

Although the SE has but one slot, you can install an accelerator board and a large-screen video board. The Radius Accelerator sports a special slot that accommodates Radius's Full Page Display and Two Page Display boards. GCC's Hyper-Charger 020 works with E-Machines' Big Picture boards. Other combination platters exist, so if you want both add-ons, shop for boards that work together.

Can We Talk?

As Macs infiltrate large businesses, more of them are being forced to communicate with mainframes, minis, and other personal computers. The Mac's built-in LocalTalk circuitry is ideal for small networks that share laser printers and hard disks, but it's too slow for the industrial-strength networking needs of big business.

Networking boards from Kinetics, AST Research, and Apple allow SEs and IIs to join high-speed networks built around the *Ethernet* networking protocols, a highspeed networking standard.

Ethernet has three big strengths. First, it's fast—able to transfer data at up to 10 megabits per second, versus LocalTalk's

230 kilobits per second. Second, it's popular. Ethernet hardware is available for Macs, IBM PCs, Digital Equipment VAXs, UNIX workstations, and even Cray supercomputers. Third, it's versatile. As a *multiple protocol medium*, Ethernet can simultaneously support several networking protocols—rules that specify how the computers and peripherals on the network communicate. That versatility means you can unite disparate computers without having to use different cabling schemes for each.

A variation on the communications theme involves installing an *internal modem* for communicating over phone lines with mainframe computers and information services such as CompuServe. In the IBM PC world, internal modems are common. But limitations of the Mac's system software have kept modems outside the Mac until just recently. One of the first internal modems for the Mac II, Hayes's Smartmodem 2400M (which should be shipping by the time you read this), installs in a Mac II slot and can be used by other Macs on a network, eliminating the need to equip each Mac with its own modem.

From Science to Sound

Another benefit of expansion slots is that they allow a mass-market computer to accommodate a potpourri of highly specialized hardware. Data acquisition boards, for example, enable the Mac to connect to scientific and engineering equipment. The MacADIOS boards from GW Instruments use analog-to-digital converters to translate incoming electrical current from measuring devices, audio systems, or lab equipment into digital data that the Mac can store, analyze, and display in graphical form. With the appropriate software, data acquisition boards can turn the Mac into an oscilloscope, a chart recorder, or even a digital audio recorder.

Speaking of sound, the debut of Steve Jobs's Next computer has sparked new interest in *digital signal processing (DSP)* boards. Boards such as Digidesign's Sound Accelerator and Southworth Music's Max Audio (both available for the SE or II) use the Motorola DSP56001 signal-processing chip, designed to manipulate massive amounts of data in real time—a necessity for recording and playing back sound.

(continues)

Multimedia, we give you the tools, you give your imagination

Captured at 24 bits with ColorFreeze-24™, color separated with Modern Artist™ 2.0



Call toll free 1-800-547-3303 for complete information on our products and multimedia, animation packages or consult your nearest Apple Dealer

Everybody talks about multimedia, Computer Friends was the first to do something about it. We are still the first to give you a complete, professional and integrated solution for your TV, print, animation and paint production requirements, at a price you can afford.

TV Producer™, Animation



Gen-Lock Overlay Card.
Basic tool for multimedia presentations. Send your presenta-

tions to video or tape them on VCR. Overlay graphics on live video. Available with animation software.

ColorFreeze-24™, Electronic Color Photography.



Capture high quality color or black and white shots from camera or VCR, modify and

save in your favorite paint program or desk-top publishing program (QuarkXpress™, PageMaker™ etc.).

Modern Artist™ 2.0



Most complete and versatile color paint program. Spectacular special effects. Includes 4 color separation for professional color printing.

PanChroma™ Printer



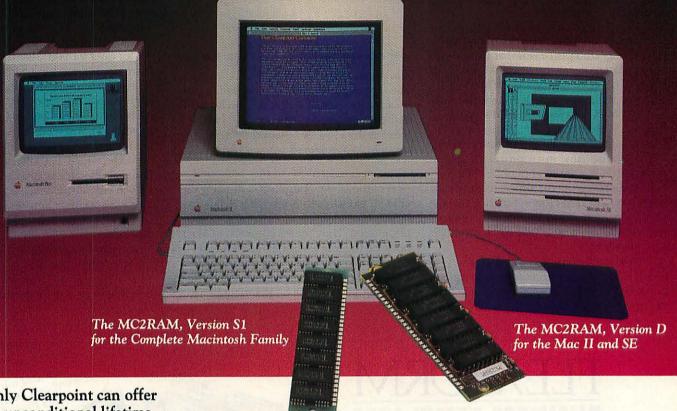
Finally 300 dpl color printing in a compact, reliable and affordable thermal color

printer. Produce beautiful color illustrations or instant color transparencies for your presentations.

Computer Friends, Inc. 14250 NW Science Park Dr. - Portland OR 97229 - tel. (503)626-2291 - fax (503)643-5379

CLEARPOINT

Delivering Memory That Won't Stop-Guaranteed!



Only Clearpoint can offer an unconditional lifetime warranty, 24-hour-a-day service and delivery from stock. Call today and ask for the MC2RAM, the fully-compatible Macintosh memory.

Choose either Version S1 (megabit SOJs, identical to the Apple SIMM) or the cost-effective Version D* (megabit DIPs). Coming from the largest manufacturer of workstation memory, the MC2RAM SIMMs are guaranteed to provide optimal performance with either state-of-the-art design.

Order your Clearpoint MC2RAM memory today and get the only Macintosh memory that won't leave you in the lurch. With Clearpoint you know you're buying everything that memory should be.

* Does not fit in Mac IIs with full-height disk drives or SEs with CPU Accelerator boards.

Clearpoint is a registered trademark of Clearpoint Research Corporation. Apple, Macintosh and Mac are trademarks of Apple Computer, Inc. DEC and MicroVAX 2000 are trademarks of Digital Equipment Corporation. Sun is a trademark of Sun Microsystems Inc. DN 3000, DN 3500, and Apollo are trademarks of Apollo Computer. COMPAQ and DESKPRO are registered trademarks of Compaq Computer Corporation.

The Clearpoint Difference

◆Lifetime Warranty

With the strictest dynamic and thermal testing in the industry, Clearpoint confidently offers a lifetime warranty—Then backs it up with a 24-hour Repair/Replacement policy and an 800 service number for a warranty with teeth.

◆ Superior Memory Design

Across the board, Clearpoint brings the workstation marketplace better memory design. Whether it's higher density or state-of-the-art DRAM technology—Clearpoint designs it better.

◆Guaranteed Buyer Satisfaction

Long-term satisfied customers is Clearpoint's goal. With comprehensive, user-friendly documentation, trade-up credits and competitive pricing, Clearpoint guarantees buyer satisfaction.



Other Clearpoint Workstation Memory

COMPAQ 386

COMRAM (compatible with the Compaq DESKPRO 386/20 and /25) 4 MB boards.

SUN FAMILY

SNXSM (compatible with Sun 3/60): Available in 1 MB SIMMs, four in a set.

SNXSC (compatible with Sun 4/110 and 386i): 1 MB SIMMs.

DEC

DCME-M20 (compatible with the Micro-VAX 2000): 8 and 16 MB boards.

APOLLO FAMILY

DNXRAM (compatible with the DN 3000 and DN 3500): 1 and 2 MB boards.

Call or write for an MC2RAM Product Marketing Update, a free catalog, and our Memory Pointers newsletter.



Dealer Inquiries Invited.



Card Card Orders Accepted

Clearpoint Research Corporation, 99 South Street, Hopkinton, MA 01748 1-800-CLEARPT (1-800-253-2778) or 508-435-2000

Dealers circle 127 on reader service card

End Users circle 375 on reader service card

How To/Getting Started

Today's DSP boards are primarily used to turn the Mac into an audio workstation capable of recording, playing, and editing digital audio. In the future, look for DSP chips to work their way into high-speed modems, voice mail and speech-recognition systems, and even image-processing and graphics hardware.

The DSP board is a form of coprocessor board—an expansion board containing a specialized processor that works with rather than replaces the Mac's. Another category of coprocessor board performs an equally specialized task: it allows the Mac to run IBM PC software (see "Mac Meets IBM"). AST Research's Mac286 and Mac86 boards—for the II and the SE, respectively —contain the same microprocessors that govern IBM PCs and compatibles. The boards themselves cost almost as much as some low-cost IBM clones, but they do simplify file transfers and are finding a home in corporations where IBM compatibility is a requirement.

Finally, I'd be remiss if I didn't mention Mac II *memory boards* such as National Semiconductor's NS8/16, which is designed to work with A/UX, Apple's ver-



Mac Meets IBM

This is progress? With AST's Mac86 and Mac286 boards—for the Mac SE and II, respectively—the Mac can run IBM PC software. Here, a Mac II is running WordStar, the venerable PC word processor by MicroPro International.

sion of the UNIX operating system. In the IBM PC world, memory boards make up a large percentage of the expansion board population. They're less common in Macs because the Mac uses a different means of expanding memory: tiny boards called *Single Inline Memory Modules (SIMMs)* that plug into sockets on the main board.

SIMMs can expand an SE's memory to 4MB, and a Mac II's memory to 8MB.

Slot Caveat

I've painted a rosy picture of the flexibility of Mac expansion slots, but problems and incompatibilities do sometimes surface. Make sure the boards you choose work with the software you use. And if you doubt your ability to install a board, let a dealer do it for you. Mac II boards are easy to install, but working within the SE requires dexterous hands and special tools. High-voltage components may cause physical harm to you as well as to the machine. In addition, you void the Apple warranty the minute you open the machine.

And what if you own a slotless Mac? Some accelerator boards and even large-screen video boards are available for the Mac Plus, but if expansion is important to you, you're better off selling your old Mac and buying an SE or a II. After all, they're among the few computers in which playing the slots isn't a gamble.

See Where to Buy for contact information.

FLEXFORM BUSINESS TEMPLATES

We Make You Look Good!

Your business runs on information—the more accurate and timely, the better you can manage. Business forms and correspondence collect and project information. Their creation deserves a lot of attention.

FLEXFORM Business Templates were designed by the experts at FORMula®, Inc. with the best forms-creation software available, SmartForm Designer™ from Claris™. You can use FLEXFORM Business Templates right out of the box or customize them with SmartForm Designer to meet your special information needs.

FLEXFORM General Business Volumes I and II provide you with a broad selection of useful, popular, and visually appealing forms. Each volume brings you a library of professionally designed forms templates to help you manage information in accounting, personnel, inventory and other critical areas of you business.

SmartForm Assistant™ from Claris, included with each FLEXFORM Business Template package, gives you the business forms solution —A \$49 value—FREE!

- · Easy entry of data into your forms prior to printing.
- · High quality printed forms can be used as camera-ready art.
- Transfer data collected on your forms to other business applications software.
- SmartForm Assistant makes data collection more efficient.

 CA 94107 (415) 957-0886

 FLENFORM Business Templates, Antic and Artic Software are trademarks of Antic Publishing Inc; SmartForm Designer, Scrafform Assistant and Claris are registered trademarks of Claris Corp; Macintosh Plus, Macintosh Eand Macintosh II are registered trademarks of Apple Inc.

 CA 94107 (415) 957-0886



Only \$8995 per volume.

Available from your local computer store or directly from Antic Software.

Call (800) 234-7001-24 hours a day.

For Macintosh Plus, Macintosh SE and Macintosh II Antic Software

544 2nd St., San Francisco,
CA 94107 (415) 957-0886

Circle 446 on reader service card

Anniversary



We're celebrating our fifth year anniversary. Join us for incredible savings on every issue of Macworld.

Discover Macworld with a Special Anniversary Savings Rate!

Each issue is packed with powerful techniques, straight-shooting reviews, tips and how-tos.

☐ YES, send me one year (12 issues) for only \$24.00. That's almost 50% off the annual cover price of \$47.40.

☐ Even bigger savings! Send me two years (24 issues) for just \$37.90.

Company _____ ☐ Please Bill Me

Address ☐ Payment Enclosed

City/State/Zip_ This rate limited to the USA and its possessions. Basic subscription price is \$30 for 12 issues. The annual cover price is \$3.95 per issue, \$47.40 for 12 issues. Please allow 6 weeks for delivery of the first issue.

INTUITIVE

Develop an understanding of the Macintosh with thought-provoking articles and insightful features.

☐ YES, send me one year (12 issues) for only \$24.00. That's almost 50% off the annual cover price of \$47.40.

☐ Even bigger savings! Send me two years (24 issues) for just \$37.90.

Company _____

☐ Please Bill Me

☐ Payment Enclosed

City/State/Zip_

This rate limited to the USA and its possessions. Basic subscription price is \$30 for 12 issues. The annual cover price is \$3.95 per issue, \$47.40 for 12 issues. Please allow 6 weeks for delivery of the first issue.

User-friendly hints and applications to make using the Mac more fun and productive

☐ YES, please send a one year subscription (12 issues) to my associate or friend listed below for only \$24.00. That's almost 50% off the annual cover price of \$47.40.

☐ Please Bill Me Later.

Send Gift To:

City/State/Zip.

Send Gift From:

Address ___

Name _

Company _

Company ___

Address __

City/State/Zip _

This rate limited to the USA and its possessions. Basic subscription price is \$30 for 12 issues. The annual cover price is \$3.95 per issue, \$47.40 for 12 issues. Please allow 6 weeks for delivery of the first issue.

2AEX6

BUSINESS REPLY MAIL FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Subscription Department P.O. Box 51666 Boulder, CO 80321-1666

Haldhadladadhalladhalladhallalad



NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES



FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Subscription Department P.O. Box 51666 Boulder, CO 80321-1666

Haddlandhaddadhaddadhadladadh



NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Subscription Department P.O. Box 51666 Boulder, CO 80321-1666

Haldhadladhalladhalladhallada

NO POSTAGE



When You **Subscribe Today!**

No other magazine helps you like Macworld. Powerful, Intuitive and Friendly. Macworld is a wealth of information which keeps you up to date on the latest products, news, tips and tactics. Dedicated exclusively to the Mac II, SE and Plus.

We look out for your interests. We tell you what's new for the Mac. What it does. Who it's for. Compare similar products-and name names! Discuss pros and cons. Assess value for money for both hardware and software.

Macworld helps you make the most of your Mac.



TACHED CARD

When NASA Started Flying Again They Chose the Macintosh

MacAcademy^m

BY RANDALL D. SMITH

ORLANDO, Fla. - NASA is flying again and many of the flickering screens in the background are Macs! And, just like everyone else, NASA needed valuable, quality, and affordable training on their Macs. On November 30th, NASA sent 58 of their top employees to *MacAcademy* in Orlando.

In October, Motorola sent 38 employees to MacAcademy in Austin. GTE sent their employees to MacAcademy in Boston. Jet Propulsion Labs, GE, and the University of California attended in Los Angeles. The FBI, the University of Texas, Federal Express, CitiCorp, Polaroid, MIT, the State of California, Mobil Oil, and over 1,000 other companies choose locations throughout the U.S. to send their employees to MacAcademy.

Over 10,000 people, individuals and corporate employees, have attended MacAcademy in the past 12 months!

Why is MacAcademy so popular? The simple answer is that it provides what most Mac owners have been looking for since the day they first used their computer. MacAcademy fills a learning gap that can't be provided by the magazines, trade shows, Apple dealers, user groups, and audio training pro-

grams. It not only provides what the graduates call the *Ultimate Macintosh Learning Experience*, but it accomplishes this task for an unbelievably low price.

MacAcademy is a two-day workshop taught by many of the nation's leading Mac experts. Each instructor is a top business executive who uses the Mac in everyday business operations. Each instructor draws on actual hands-on experience when teaching the operation of the Mac, Excel, Word, FileMaker, Page-Maker, HyperCard, and Works.

MacAcademy offers a smorgasbord of workshops allowing each participant the luxury of choosing their own individual class schedule.

Graduates who have attended MacAcademy have given the learning experience an overall rating of 4.5 on a scale of 1 to 5. The entire two days is only \$249 which includes the workshops, class materials, and even lunch.

MacAcademy is designed for Mac owners who are facing the Mac training void and want to slash the learning curve.

To register for MacAcademy or for more information, call 904-677-1918 or write to: MacAcademy 142 Cone Rd. Ormond Beach, FL 32074.

Schedule of Upcoming MacAcademy Workshops

Atlanta	Mar. 2, 3
Boston	Mar. 20, 21
New York	Mar. 22, 23
Philadelphia	Mar. 27, 28
Wash. D.C.	Mar. 29, 30
Detroit	Apr. 6, 7
St. Louis	Apr. 10, 11
Minneapolis	Apr. 14, 15
Chicago	Apr. 17, 18
Milwaukee	Apr. 24, 25
San Diego	May 8, 9
Anaheim	May 11, 12
Los Angeles	May 15, 16
San Jose	May 18, 19
San Francisco	May 22, 23
Denver	June 5, 6
Spokane	June 8, 9
Las Vegas	June 12, 13
Phoenix	June 19, 20
Salt Lake City	

On-Site Corporate Training Also Available

2 Full Days

9 Mac Business Experts 14 Hrs. Of Instruction Workshop, Computer Discs, Workbook, & Lunch

Only

\$249

©1989 Florida Marketing International, Inc.

Circle 406 on reader service card

Here today.

More than meets the eye • We carry 100's more products, call for latest price.

Accessories

3m
40 Meg Dc-2000 Tape Cartridge 23.
Abaton
Pro Point Adb (SE & II)
Addison Wesley
Inside Macintosh, Vol. 1-4 (Soft Back), 21 ea
Inside Macintosh, Vol. 1-4 (Soft Back) . 21.ea Inside Macintosh, Vol. 5 (Soft Back)
Asher Engineering
Turbo Trackball Adb (SE & II)85.
Bantam Books
Illustrator 88: Official Designers Handbook 19.
Complete Hypercard Handbook (2nd Ed.) 23.
Benko-Wren
Macstation II Platinum
Datadesk
Hyper Dialer 29.
Hyper Dialer
Ergotron
Mantill 70
Mactilt
Golden Ribbons
Imagewriter Ribbons -Black4.
Kalmar Designs
Teakwood Disk File Cab. (Holds 45 Disks) . 19.
Teakwood Disk File Cab. (Holds 90 Disks) . 29.
Kensington Microware
System Saver Mac Fan68.
Turbo Mouse119.
Kraft.
THE PROPERTY OF THE PARTY OF TH
Quickstick
Farallon
Mac Recorder150.
Mac Packs Come in Gray Navy Wine
Imagewriter Bag49.
Mac Plus/SE Bag
Mac SE Bag Xt (Extended Keyboard) 74.
Mac Zone
7 Outlet Noise & Surge Protector24.
800k Disk Drive (Platinum)
Mouse Pad Blue Gray Red6.ea
Tool Kit Open Mac With Grounding Strap20.
Msc Msc with Grounding Strap20.
A+ Mouse Adb (SE & II)85.
A+ Mouse (512k & Plus)
Orange Micro
Grappler Mac .78. Grappler Mac Lq .91. Grappler Mac Ls .99.
Grappler Mac Lq91.
Grappler Mac Ls99.
Scancofurn
Mac Table With Cabinet450.
Smith & Bellows
Diskette Chest - Mahogany (Holds 96 Disks) .35.
Sony Disks
Double Sided - 10 Pack
Double Sided - Bulk (Min. Order 50) 1.65
Symmetry
Hyper DA38.

Mo		Friday:	6AM			PST
Sat	urday:		7AM	to 5	M	PST
		Friday:				PST
AME	RICAN	ISA, MAS EXPRESS a added.			ard	

-	Property lands	-
	0-	VISA
All prices	subject to chang	J 0
	subject to availa	bility.

Business	
Aatrix	
Payroll 3.01	QR
Payroll Plus	
Acius .	
4th Dimension	549.
Aec Information Management	
Aec Information Manager	575.
Agnis Davelonment	
Doug Clapp'S Word Tools 1.2	.45.
Ashton-Tate Dbase Mac	200
Full Impact	200.
Full Impact	248
Blyth Software	
Omnis 3+ & Express 3.3 (1-3 Users) .	395.
Bootware Software	
Resume Writer Pro	. 60.
Mac Calc	.78.
Caere	-75
Omni Page	5/5
Mac Link Plus W/Cable	120
Deneba Software	100.
Coach Professional	109
Coach Thesaurus	.36.
The Big Theu	. Call
Electronic Arts	
Thunder II	.48.
Fox Software	
Foxbase+/Mac	209.
Foxbase / Mag Pup Time wall in the control of the c	359.
Foxbase+/Mac Run Time (Unlimited Users) Freesoft	298.
Red Ryder 10.3	56
Haupe	
Smartcom II	.99.
Quicken	.32.
Meca	
Managing Your Money	128.
TENpoint0 Focal Point II	100
Reports Micro Lytics	.00.
Gofer	44
Word Finder	.34.
Microsoft	
Excel 1.5	259.
File 2.0	149.
Word 3.02	259.
Works 2.0	205.
Write	119.
Dollars & Sense 4.0	80
Business Sense	262
Odesta	
Double Helix Release 2	337.
Olduval Software	
Read-It!	199.
Read-Itl Ts	.79.
Paragon Courseware	205

Preferred Publishers	
Database	Call
Softview	
Macintax Federal 88	64.
Tax View Planner	05.
Software Discoveries	44
Record Holder Plus	44.
Software Ventures Microphone 1.5	100
Microphone II	221
Survivor Software	
Mac Money 3.0	64
Symantec	
Macsqz 1.5	49
More II	249
T/Maker	
Write Now 2.0	Call
Traveling Software Lap-Link Mac V.2.0	
Lap-Link Mac V.2.0	89
Wordperfect Corp.	1 7 74
Wordperfect Corp. Wordperfect	189
Cronbine	
Graphics	
3g Graphics	
	65
Business 1	58
Aldus	
Freehand 2.0	445
Pagemaker 3.0	510
Persuasion	Call
Cricket Software	
Cricket Draw	168
Cricket Graph	118
Cricket Paint	118
Cricket Presents	285
Pict-O-Graph	104
Deneha Software Canvas 2.0	169
Dubl-Click Software	100.
Wetpaint	
Classic Clip Art • For Publishing •	
Animal Kingdom . Special Occassi	
Printer'S Helper . Industrial Revolu	
Old Earth Almanac . Island Life	
World Class Fonts	
Vol 1 & 2 (The Original) Vol 3 & 4 (The Stylish)	43.
Vol 3 & 4 (The Stylish)	43.
Vol 5 & 6 (The Giants)	43.
Electronic Arts	040
Studio Eight	319.
Comis Popula (Vol. 1 Office Deve)	or
Comic People (Vol.1 Office Days) .	40
Comic Strip Factory Innovative Data Design	40.
Dreams	208
Macdraft 1.2b	149
Lacorwaro	
Laserpaint Color II	359
Letraset	
Image Studio	299
Letra Studio	327.
Image Studio	289.
Ready, Set, Show	189.
Letra Fonts (Postscript)	P 11
Lotta i onto (i obtablipt)	Call.
Long volid (i datability	Call.

Video Works II 170
Video Works II
Microsoft
Power Point 2.0
Laser Fx117.
Shana Enterprises
Fast Forms Construction Kit96.
Silicon Beach Software
Digital Darkroom
Silicon Press48.
Super 3d
Super 3d (Enhanced)
Super Paint 2.0 109.
Symmetry
Picture Base 1.2 & Pb Retriever 62.
T/Maker Click Art Business Images
Click Art Christian Images
Eps Illustrations
Zedcor Inc
Deskpaint V.2.0
Educational
Borland
Eureka: The Solver128.
Bright Star Technology
Alphabet Blocks (Req. 1mb)30.
Talking Tiles (Req. 1mb)68.
BrØderbund
Type! 20
Great Wave Software
Kids Time26.
Mindscape
S.A.T./ Perfect Score
Nordic
Nordic Alphabetizer • Bodyworks • Clockworks
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search 28.ea The Learning Company Reader Rabbit 36. True Basic Algebra • Arithmetic • Calculus Discrete Mathematics • Pre-Calculus / Trigonometry • Probability Theory Truestat 35.ea Games Access Software World Class Leader Board 30. Accolade 4th & Inches 28. Hardball 27. Activision
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search 28.ea The Learning Company Reader Rabbit 36. True Basic Algebra • Arithmetic • Calculus Discrete Mathematics • Pre-Calculus / Trigonometry • Probability Theory Truestat 35.ea Games Access Software World Class Leader Board 30. Accolade 4th & Inches 28. Hardball 27. Activision Universal Military Simulator 34.
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search 28.ea The Learning Company Reader Rabbit 36. True Basic Algebra • Arithmetic • Calculus Discrete Mathematics • Pre-Calculus / Trigonometry • Probability Theory Truestat 35.ea Games Access Software World Class Leader Board 30. Accolade 4th & Inches 28. Hardball 27. Activision Universal Military Simulator 34. Brøderbund Ancient Art Of War At Sea 30. Autoduel 28. Moebius 28. Shufflepuck Cafe 28.
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search 28.ea The Learning Company Reader Rabbit 36. True Basic Algebra • Arithmetic • Calculus Discrete Mathematics • Pre-Calculus / Trigonometry • Probability Theory Truestat 35.ea Games Access Software World Class Leader Board 30. Accolade 4th & Inches 28. Hardball 27. Activision Universal Military Simulator 34. Brøderbund Ancient Art Of War At Sea 30. Autoduel 28. Moebius 28. Shufflepuck Cafe 28. Bullseye Software Ferrari Grand Prix 22. P-51 Mustang Flight Simulator 31. Discovery Software Arkanoid 30. Electronic Arts
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search 28.ea The Learning Company Reader Rabbit 36. True Basic Algebra • Arithmetic • Calculus Discrete Mathematics • Pre-Calculus / Trigonometry • Probability Theory Truestat 35.ea Games Access Software World Class Leader Board 30. Accolade 4th & Inches 28. Hardball 27. Activision Universal Military Simulator 34. Brøderbund Ancient Art Of War At Sea 30. Autoduel 28. Moebius 28. Bullseye Software Ferrari Grand Prix 28. Bullseye Software Ferrari Grand Prix 32. P-51 Mustang Flight Simulator 31. Discovery Software Arkanoid 30. Electronic Arts Chessmaster 2000 28.
Nordic Alphabetizer • Bodyworks • Clockworks Coinworks • Earthworks • Flashworks Lemonade Stand • Naval Battle Preschool Disk 1 • Preschool Disk 2 Word Search 28.ea The Learning Company Reader Rabbit 36. True Basic Algebra • Arithmetic • Calculus Discrete Mathematics • Pre-Calculus / Trigonometry • Probability Theory Truestat 35.ea Games Access Software World Class Leader Board 30. Accolade 4th & Inches 28. Hardball 27. Activision Universal Military Simulator 34. Brøderbund Ancient Art Of War At Sea 30. Autoduel 28. Moebius 28. Shufflepuck Cafe 28. Bullseye Software Ferrari Grand Prix 22. P-51 Mustang Flight Simulator 31. Discovery Software Arkanoid 30. Electronic Arts

1-800-248-0800



Canada: 1-800-248-0344 FAX: (206) 881-3421

There tomorrow.

\$3 Overnight shipping on all orders • We ship and deliver on Saturdays

Sub Battle	21
Groone Inc	
Crystal Quest 2.2	26
Infinity	20.
Go • Grand Slam Tennis	27.ea
Infocom	
Quarterstaff (Reguires 1 Megabyte) .	35.
Mediagenic	
Might & Magic	38.
Shanghai	24.
Microprose	
Pirates!	38.
Microsoft	
Flight Simulator	36.
Miles Computing	-
Fool's Errand	35.
Harrier Strike Mission II	35.
Mindscape	24
Aussie Joker Poker	34.
Colony • Crossword Magic	30 02
Doia Vi	30.64
Deja Vu	32
Shadowgate	30
Trust And Betrayal	30
Uninvited	
PBI Software	
Strategic Conquest Plus	34.
PCAI	
Lunar Rescue	36.
Mac Courses	28.
Mac Golf	35.
Mac Golf	36.
Road Racer	39.
Silicon Beach Software	
Silicon Beach Software Apache Strike	27.
Silicon Beach Software Apache Strike Beyond Dark Castle	27.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle	27.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech	27. 27. 27.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry	27. 27. 27.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere	27. 27. 27.
Silicon Beach Software Apache Strike	27. 27. 27. 40.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter	27. 27. 27. 40. 28.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109	27. 27. 27. 40. 28. 28.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale	27. 27. 27. 40. 28. 28. 32.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) (Color Version) Tetris (Plus, SE & II) (B & W Version)	27. 27. 27. 40. 28. 28. 32. 21. 25.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) {Color Version} Tetris (Plus, SE & II) {B & W Version} Spinnaker	27. 27. 27. 40. 28. 28. 32. 21. 25. 22.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) {Color Version} Tetris (Plus, SE & II) {B & W Version} Spinnaker Sargon IV	27. 27. 27. 40. 28. 28. 32. 21. 25. 22.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) (Color Version) Tetris (Plus, SE & II) (B & W Version) Spinnaker Sargon IV Xor Corporation	
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) {Color Version} Tetris (Plus, SE & II) {B & W Version} Spinnaker Sargon IV Xor Corporation Nfl Challenge	27. 27. 27. 40. 28. 32. 21. 25. 22. 30.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) (Color Version) Tetris (Plus, SE & II) (B & W Version) Spinnaker Sargon IV Xor Corporation	27. 27. 27. 40. 28. 32. 21. 25. 22. 30.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) {Color Version} Tetris (Plus, SE & II) {B & W Version} Spinnaker Sargon IV Xor Corporation Nfl Challenge Pro Challenge	27. 27. 27. 40. 28. 32. 21. 25. 22. 30.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) {Color Version} Tetris (Plus, SE & II) {B & W Version} Spinnaker Sargon IV Xor Corporation Nfl Challenge	27. 27. 27. 40. 28. 32. 21. 25. 22. 30.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) (Color Version) Tetris (Plus, SE & II) (B & W Version) Spinnaker Sargon IV Xor Corporation Nfl Challenge Pro Challenge Hardware Abaton	27. 27. 27. 40. 28. 28. 25. 25. 22. 30. 59. 30.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) (Color Version) Tetris (Plus, SE & II) (B & W Version) Spinnaker Sargon IV Xor Corporation Nfl Challenge Pro Challenge Hardware Abaton Interlax 12/48 Fax/Modem	27. 27. 27. 40. 28. 28. 25. 25. 22. 30. 59. 30.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) {Color Version} Tetris (Plus, SE & II) (B & W Version) Spinnaker Sargon IV Xor Corporation Nfl Challenge Pro Challenge Hardware Abaton Interlax 12/48 Fax/Modem CMS	27. 27. 27. 40. 28. 32. 21. 25. 22. 30.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) {Color Version} Tetris (Plus, SE & II) {B & W Version} Spinnaker Sargon IV Xor Corporation Nfl Challenge Pro Challenge Hardware Abaton Interlax 12/48 Fax/Modem CMS Macstack 20	27. 27. 27. 40. 28. 32. 21. 25. 22. 30. 59. 30.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) {Color Version} Tetris (Plus, SE & II) {B & W Version} Spinnaker Sargon IV Xor Corporation Nfl Challenge Pro Challenge Hardware Abaton Interlax 12/48 Fax/Modem CMS Macstack 20 Macstack 30	27. 27. 27. 40. . 28. . 32. . 21. 25. 22. 30. 59. . 30. 398.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) (Color Version) Tetris (Plus, SE & II) (B & W Version) Spinnaker Sargon IV Xor Corporation Nfl Challenge Pro Challenge Hardware Abaton Interlax 12/48 Fax/Modem CMS Macstack 20 Macstack 30 Macstack 43	27. 27. 27. 40. 28. 28. 32. 21. 25. 22. 30. 59. 30.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) (Color Version) Tetris (Plus, SE & II) (B & W Version) Spinnaker Sargon IV Xor Corporation Nif Challenge Pro Challenge Hardware Abaton Interlax 12/48 Fax/Modem CMS Macstack 20 Macstack 30 Macstack 43 Macstack 43 Macstack 43 Macstack 60	. 27. . 27. . 27. . 40. . 28. . 32. . 21. . 25. . 22. . 30. . 59. . 30. . 398. . 529. . 625. . 785. . 890.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) (Color Version) Tetris (Plus, SE & II) (B & W Version) Spinnaker Sargon IV Xor Corporation Nif Challenge Pro Challenge Hardware Abaton Interlax 12/48 Fax/Modem CMS Macstack 20 Macstack 30 Macstack 43 Macstack 43 Macstack 43 Macstack 60	. 27. . 27. . 27. . 40. . 28. . 32. . 21. . 25. . 22. . 30. . 59. . 30. . 398. . 529. . 625. . 785. . 890.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) {Color Version} Tetris (Plus, SE & II) (B & W Version) Spinnaker Sargon IV Xor Corporation Nfl Challenge Pro Challenge Pro Challenge Hardware Abaton Interlax 12/48 Fax/Modem CMS Macstack 20 Macstack 30 Macstack 43 Macstack 43 Macstack 43 Macstack 60 Platinum 170 Tapestack 60mb Scsi Tape Backup	. 27. . 27. . 27. . 40. . 28. . 32. . 21. . 25. . 22. . 30. . 59. . 30. . 398. . 529. . 625. . 785. . 890.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) (Color Version) Tetris (Plus, SE & II) (B & W Version) Spinnaker Sargon IV Xor Corporation Nit Challenge Pro Challenge Hardware Abaton Interfax 12/48 Fax/Modem CMS Macstack 20 Macstack 20 Macstack 43 Macstack 43 Macstack 60 Platinum 170 Tapestack 60mb Scsi Tape Backup CMS (Mac II Internal)	. 27. . 27. . 27. . 40. . 28. . 32. . 21. . 25. . 22. . 30. . 59. . 30. . 398. . 529. . 625. . 785. . 890. . 1695. . 725.
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) (Color Version) Tetris (Plus, SE & II) (B & W Version) Spinnaker Sargon IV Xor Corporation Nfl Challenge Pro Challenge Pro Challenge Hardware Abaton Interlax 12/48 Fax/Modem CMS Macstack 20 Macstack 30 Macstack 43 Macstack 43 Macstack 43 Macstack 43 Macstack 43 Macstack 60 Platinum 170 Tapestack 60mb Scsi Tape Backup CMS (Mac II Internal) Platinum 170 II/I	
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) (Color Version) Tetris (Plus, SE & II) (B & W Version) Spinnaker Sargon IV Xor Corporation Nfl Challenge Pro Challenge Pro Challenge Hardware Abaton Interlax 12/48 Fax/Modem CMS Macstack 20 Macstack 30 Macstack 43 Macstack 43 Macstack 43 Macstack 43 Macstack 43 Macstack 60 Platinum 170 Tapestack 60mb Scsi Tape Backup CMS (Mac II Internal) Platinum 170 II/I	
Silicon Beach Software Apache Strike Beyond Dark Castle Dark Castle Sir Tech Wizardry Sphere Gato 1.4 Orbiter Pt 109 Solitaire Royale Tetris (Mac II Only) {Color Version} Tetris (Plus, SE & II) {B & W Version} Spinnaker Sargon IV Xor Corporation Nfl Challenge Pro Challenge Hardware Abaton Interlax 12/48 Fax/Modem CMS Macstack 20 Macstack 20 Macstack 43 Macstack 43 Macstack 40 Platinum 170 Tapestack 60mb Scsi Tape Backup CMS (Mac II Internal) Platinum 90 II/I	. 27. . 27. . 27. . 40. . 28. . 32. . 21. . 25. . 22. . 30. . 59. . 30. . 398. . 529. . 625. . 785. . 785. . 1598. . 725.

Pro 45-SE/R72	5
Pro 102-SE/R	9
Connor	J.
Zone 100-SE/II (Mac SE & II Internal) 104	5
	J.
Daystar Digital	0
Daystar 33/030 Accelerator II 468	oU.
Novy Systems	0
Novy Mac20mx-16mhz	19.
Novy Mac20mx-25mhz	U.
NOVY Mac20mx-25mhz (Mac SE) 133	U.
Dove	
Macsnap 2SE (1mb To 2mb Upgr Mac SE) .43	
Macsnap 524 (512k To 1mb Upgrade)31	2.
Macsnap 524E (512ke To 1mb Upgrade) 28	
Macsnap 524S (512ke To 1mb W/Scsi Port) . 37	8.
Macsnap 548 (512k To 2mb) 57	5.
Macsnap 548E (512ke To 2mb)	19.
Macsnap 548S (512ke To 2mb W/Scsi Port) . 59	8.
Marathon 020, Mse1 (Board Only)58	34.
Marathon 020, Mse2 (Board & 1 Mb) 97	5.
Marathon 020, Mse3	4.
Marathon 020, Mse4115	14.
Plus 2 (1mb To 2mb Upgrade - Mac Plus) 42	29.
Scsi Port Adapter11	5.
pic	
Epic 2400 Int. Mac II Modem31	5.
verex	
Emac 20d	29.
Emac 40-Imp Plus Impact Series 85	50.
Emac 60/60dtl Deluxe	95.
Emac 60t Tape Back Up84	15.
Wacintosh	
2 One Meg Cmos Simms (Dip /100 Ns) . Ca	all.
2 One Meg Simms (100 Ns) SM	all.
256k Simm Module (120 Ns)Ca	all.
Megagraphics	-175
2008 8 Bit Color Board For Mac II 136	39
Megascreen 19" Display129	98
Megascreen 2001 B&W Board Kit Mac II 64	15
Megascreen 2008 Color For Mac II 394	15
Megascreen II Kit For Mac 512/Plus49	18
Megascreen SE Kit	26
Motorola	-0.
68881 Math Co-ProcessorsC	all
Nuvotech	art
Turbo Net St	38
Turbo Net	30
PLI	
Infinity 40 Turbo Removable 129	98
Infinity 40/40 Turbo Removables 219	95
Seagate	JJ.
Zone 20-SE/II (Man SE & Illaterral)	45
Zone 30-SE/II (Mac SE & II Internal) 44	00
Zone 45-SE/II (Mac SE & II Internal)	an
	JU.
Sharp Jx 450 Color Scanner	95
Shiva Corporation	JJ.
	10
Netbridge	50
Netserial X232	ng.
Out Taskaslanian	
Fax Stf	54
Supra Corp.	04.
Supra Modem 2400 Baud1	
Thunderware	10.
Thunderware Thunderscan 4.01	ga
Circle 70 on	re

Languages	
Borland	
Turbo Pascal 1.1	. 65.
Mainstay V.I.P. (Visual Interactive Programming)	.90.
Microsoft	
Quick Basic	. 69.
Paragon Courseware Qued-M	105.
Symantec	
Just Enough Pascal	.48.
Lightspeed C 3.0 Lightspeed Pascal 2.0	.77.
Tml Systems	
Tml Pascal II	.79.
True Basic 3-D Graphics Toolkit	.49.
Business Graphics Toolkit	.49.
Scientific Graphics Toolkit	.35.
Zedcor Inc	. 00.
Zbasic 5.0	115.
Music	
Practica Musica 2.0	. 78.
Rogas Productions	
Country • String Quart. • Hvy. Met.	15.ea
Studio Session	. 79.
BrØderbund	
Jam Session	30.
Mac Drums	38.
Electronic Arts	
Deluxe Music Construction Set 2.5 . Great Wave Software	89.
Concertware + 4.0	39.
	78
Audio Digitizer	145
Mark Of The Unicorn	
Professional Composer V.2.2 Professional Performer V. 2.3.1	.395
Professional Performer V. 2.3.1 Passport Designs	.325
Master Tracks Jr	.102
Master Tracks Pro 3.0	.275
Notewriter Passport Midi Interface	. 199
Resonate	
Listen 2.0	65
Utilites	
Affinity	
Tempo II	88
Alsoft	20
Disk Express Font/DA Juggler Plus	41
Master Juggler	63
Berkeley System Design	60
Stepping Out 2.0 Bright Star Technology	
Hyper Animator (Req. 1mb)	78
dor corvice card	

Calendarmaker 3.0	.27.
Calendarmaker 3.0	.27.
Quick Keys Ver. 1.1	.54.
Quick Mail (10 Users) V2.0	174.
Central Point Software	
Copy II Mac (Version 7.2)	.22.
PC Tools Deluxe	. 48.
Fifth Generation	
Fast Back	. 53.
Power Station V2.5	.36.
Suitcase 2.0	. 44.
Greene Inc	
Quickdex	.32.
Hjc Software	
Virex	.68.
Mac Master	
Fedit+	.28.
Microseeds	
Redux	.65.
Olduvai Software	
DA-Switcher	. 29.
Softview	
Mac In Use 2.0	. 45.
Solutions	
Backfax Smartscrap & The Clipper 2.0	139.
Smartscrap & The Clipper 2.0	. 49.
Super Glue	.51.
The Curator	.79.
Supermac Software	
Disk Fit 1.4	. 60.
Network Disk Fit	245.
Sentinel	149.
Super Laser Spool - Multi User (1 To 5)	240.
Super Laser Spool 2.0 - Single User	
Superspool 5.0	. 55.
Symantec	00
S.U.M. (Symantec Utilities For Macintosh)	69.
Symmetry	75
Acta Advantage	. /5.
Tops, Inc. Tops (Dos Version)	0-11
TOPS (Dos Version)	Call.
Tops (Mac Version)	Call.
Williams & Macias Labels, 216 (Laserwriter)	00
Labels, 216 (Laserwriter)	20.
My Disklabeler (Laser Version)	34.
My Disklabeler Color	31.

CE Software

Ordering Information

- If we must ship a partial order, we never charge freight on the shipments that complete the order (U.S. only).

 120 day limited warranty on all products.

- 120 day limited warranty on all products.*

 Personal and company checks under \$1,000 clear immediately.

 Please allow one week for checks over \$1,000.

 Fortune 1,000 and Government checks clear immediately.

 Purchase orders pay actual shipping charges by weight.

 No sales tax, except for WA residents add 8.1% to total adductions.
- including shipping.

 Loan drives subject to availability.

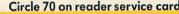
 Your credit card will not be charged until your products ship.

Shipping Information

- Federal Express overnight service \$3.007order (software orders, Continental U.S. only). Hardware items over 4 lbs incur additional shipping charges. All shipments insured at
- no extra cost.
 -APO/FPO orders shipped 1st class mail, charged by weight.
 -Overseas: We ship to any destination in the Free World. We use the quickest and least expensive methods possible.
 Second day air service is available to most of Europe, Austra-
- Second day ar service is available on most or currope, vasua-lia, and Japan.

 Software and hardware is subject to manufacturer's war-ranty. Defective items will be replaced immediately with like litem. All opened software sales are final. Hardware and unopened software ordered by mistake is subject to a 20% restocking fee. Defective hardware replaced or repaired at our discretion.

All returns must have an authorization number, call (206) 883-1975. The MacZone is a trademark of Multiple Zones International 6825 176th Ave. N.E. Suite 100, Redmond, WA 98052



1-800-248-0800



Canada: 1-800-248-0344 FAX: (206) 881-3421

Fast Forms

Paperwork Without The Work.



When presenting business information, it is important to portray a professional and consistent image. Business forms are no exception.

Fast Forms gives you the power and freedom to create, customize, and use professional forms on your Apple® Macintosh® computer.

You can use Fast Forms for tasks ranging from simple office memos to order forms, packing slips, complex invoices or even annual tax forms.

All with the flexibility to match the look of your most familiar forms.

And once you've drawn or scanned your forms, use the Fast Forms desk

accessory (also included) to fill in and print while using any other program.

At last you can quickly address an envelope or print an invoice without interrupting your more important work.

Design features such as gray screens, hairlines, variable type sizes, text editing, customizable grids, and printing and

drawing a form

non-printing drawing planes have made Fast Forms the drawing program of choice by **thousands of users**.



pen / fill patterns

Place data entry fields on your form where information is filled in. Fast Forms will format fields and even perform calculations for you automatically.

Since version 1.2 now supports both **import and export**, Fast Forms works even better with your other Macintosh programs.

Now you can import information

from your database to fill in and print any form, or export information while using Fast Forms as an effective data entry tool.

For offices with more than one Macintosh, additional desk accessories can be purchased separately.

And yes, for those of

you who want some help getting started, Fast Forms still comes with a free template disk filled with forms ready to use. Since Fast Forms is still **only \$149**, you're guaranteed great value for your money.



filling out a form

Plus, if you buy Fast Forms today, we'll refund your money tomorrow (early 1989) when you purchase INFORM," the next generation of forms management solutions.

For more information on Fast Forms, please call or write:



Advanced Technology Center 105, 9650 - 20 Avenue Edmonton, Alberta Canada T6N 1G1

(403) 463 - 3330

Fast Forms and INFORM (formerly Fast Forms Professional) are trademarks of Shana Corporation. Apple and Maciniosh are registered trademarks of Apple Computer, Inc. Copyright © 1988 Shana Corporation

Insights on FileMaker II

Fifteen tips offer database savvy

by Tom Negrino

The spirit of Charles Darwin is alive and well in today's software industry. Even excellent software must evolve and improve to stay competitive in the marketplace. A case in point is FileMaker, now published by Claris Corporation. This powerful, easy-to-use database manager has grown through three major versions and as many publishers.

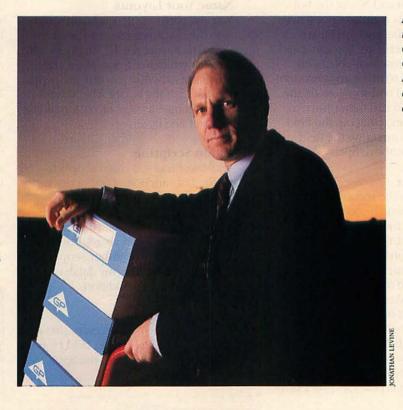
FileMaker II adds many new features to FileMaker Plus. (FileMaker II is basically the same program as its predecessor, FileMaker 4, from Nashoba Systems; Claris changed the product's name and fixed some minor bugs after acquiring Nashoba in 1988.) Form creation, always a strong area for the program, was made easier with the increase and improvement of the tools available for layout design. The program is now multiuser over a LocalTalk network and can be networked with or without file-server software such as AppleShare or TOPS.

My thanks to FileMaker power users Phyllis Hurwitz, Tim Winders, Peter McKone, and Claris's Dennis Marshall for sharing their expertise. Additional thanks go to Joe Kroeger and Keith Kiel of the FileMaker Report, an excellent source of information on the program.

Compatibility Pays Off

If you're like most people, you create more than one database in order to meet several different needs. Try to use the same field names for similar fields in all your files. (Don't use *Zipcode* in one file and *Zip Code* in another, for example.) That way, you can easily copy layouts from file to file. And then you can use any file as a lookup file, even if you didn't plan to originally.

Tom Negrino is a partner in Third Wave, an Apple value-added reseller. He also runs a Macintosh consulting business and is a member of the board of directors of the Los Angeles Macintosh Group.



Douglas MacKay runs the Packer Printing Company of Mystic, Connecticut, by using FileMaker to generate daily reports for many aspects of his business.

When you duplicate a layout within a file, the parts are also duplicated. But when you copy and paste a layout to another file, only the fields are copied. So you'll need to reset the Header, Body, Sub-Summary, and Footer parts as needed.

Form and Function

You can create impressive forms with FileMaker II's built-in drawing tools, but those tools just don't have all the bells and whistles of a dedicated drawing program. For more complex forms, it's easy to bring the power of drawing programs to your database. First, create a complex form in an object-oriented program like MacDraw or SuperPaint's Draw layer. Copy the form to the Clipboard or Scrapbook and then paste

it onto a blank FileMaker layout. Now you can superimpose your fields over the proper places.

Beware of placing fields on areas of the pasted-in image that have fill patterns. Fields are transparent, so the text in the field can get lost in the pattern. To make sure the field information is legible, you can leave appropriate white spaces while drawing the original form. Or, back in File-Maker, you can draw a white box the same size and shape as the field, position it on the pasted form, and then place the field on top of the white box.

Sticking to the Format

When creating layouts, you'll usually want the fields or layout text to have the same font sizes or styles. When you create a new field, it takes on the characteristics of

the last field you clicked on. So before pulling the field tool onto the layout, click the cursor on a field with the font, size, style, and alignment you want the new field to have. Similarly, when using the text tool, click inside a text area whose characteristics you want to duplicate before you start a new text area.

Adding Definition

If you define a new field while on an existing layout, FileMaker adds the new field in its default font and size at the bottom of the layout. This is usually not where you want the field to be, and you have to reset the field's characteristics. You can avoid this by creating a "throwaway" blank layout. Go to this layout to make any new definitions. The new field will show up on the throwaway layout. You can then return to the intended layout and drag out the field using the field tool, formatting the field properly by using the above tip.

Keeping Order

FileMaker stores the records in a database in the order in which you entered them. When you use the Sort command, the program temporarily changes the order in which the records are presented. To permanently keep your database in a sorted order, first sort the file. Then clone the file (cloning a file makes a copy of the file with no records), and finally, using the Input From menu choice, import into the cloned file the records from the sorted file. FileMaker will use the sorted order that the records came in as the default. As you add new records, you can repeat this process to keep the file sorted.

Clandestine Finds

Often you'll want to do Finds on a particular field in a layout, yet you won't want that field to print. For example, you may want to find and print mailing labels for all the people who belong to a particular group without having to print the name of the group itself on the label.

One simple trick is to put fields you're likely to use for Finds to the side, out of the printing area. You can label them and it won't show on your printout.

Another technique is to use a script. Scripts, accessed through the Custom menu, tell FileMaker to reset the state of a file to what it was when the script was recorded and to perform one or more functions, such as switching layouts, doing finds or sorts, or printing. When you use a script, the field doesn't even need to be on the layout when you do a find. First you put the field on the layout. Do a find and (if desired) a sort, then create a script. After the script is set, go back to the layout and delete the field. The script still remembers the field and the criteria for the find and the sort, but the field no longer appears on your layout or when you print.

Name Your Layouts

You can name particular layouts and switch to them automatically, without returning to the Layout mode. Simply switch to the layout while in Layout mode, then save the task as a script, and title the script with the name of the layout. The Scripts menu can become a list of layouts, making access easier and faster.

Chain Scripting

FileMaker lets you chain scripts together; the last function of one script can be to perform any other script. I have a script in a billing database that finds the records of just those clients with unpaid bills (you know who you are), sorts and prints them, then calls another script that performs Find All, so that my database ends up in its original condition.

Customized Helpers

You can use the pop-up entry lists in FileMaker as a unique, online, field-by-field assistance tool (see "Help on the Spot").



Help on the Spot

You can use FileMaker's list-of-values feature for field-by-field reminders or belp.

Since the list-of-values entry box can hold up to 32K of text, it can be used to display information on how to fill out a particular data entry screen or form. This is especially useful if you use FileMaker across a network in a work group in which the

users who enter the data don't necessarily design the database. Remember that the size of the pop-up box is determined by the size of the field it works with, so make sure you size your fields accordingly.

One to a Customer

To eliminate duplicate mailing labels, create a normal label layout but put a subsummary part in place of the normal body line. Sub-summary parts will only show one value for duplicate data when your data is sorted by the key field. Add a "subsummary when sorted by customer number" part or by any other key field that is able to group duplicates together. Then remove the body line and move the subsummary part to exactly where the body line used to be (see "No Duplicates").

When you sort by the key field, File-Maker prints only one label for each subsummary group. For this trick to work with two-up or three-up labels, you'll need to click on the Down First radio button in the Column Setup dialog box. If you select the default Across First radio button, FileMaker will only print one column, even if you specified two or three columns in the Column Setup box.



No Duplicates

Replacing the usual body line with a sub-summary part eliminates duplicate labels. Don't forget to sort on the key field first.

Looking Inside

FileMaker can look up data from another file, then use that data to fill out fields in the active record. The lookup function or option is triggered when what you type in a lookup field matches a value in a field in the lookup file. For example, you can type a customer account number and FileMaker will look in another file for

Quicken gives you Quicken automatithese reports in cally updates your seconds: check register, recal-· Budget vs. Actual culates balances, · Taxable Income/ and prints your Deductions checks. · Income and Expense (P&L) Quicken is easy Rental Property/ because it looks like Job Costs your paper check-Accounts Payable book. There's · Cash Flow/Cash nothing new to Needs learn. · Payroll Taxes. Quicken eliminates Quicken prints work. It instantly checks even on writes recurring laser printers. checks without Preapproved by all typing. financial institu-930.40 9,544.93 tions, Ouicken 1020 checks are easily ordered through the form in the package. 3

Stop Taxing Yourself. Quicken, \$49.95

uicken* is the absolute fastest, easiest way to do your personal and small business finances. You'll slash time and effort every month, plus have perfectly organized financial records. Now instead of dreading tax time, you'll save even more hours, because Quicken links directly with the top selling Macintosh* tax software, MacInTax*

Forget Financial Hassle

Quicken is so automatic, it does your monthly financial work for you. It actually learns your regular bills. Just click to confirm the payment amounts on your auto loan, utilities, and other bills. Quicken does 14 bookkeeping steps and hands you the printed checks already addressed for mailing. All you do is sign them and seal the envelopes.

Automate Your Taxes, Too!

Ouicken saves you hours at tax time, because all your tax information is right at your fingertips. It prints itemized lists supporting tax deductions in just seconds. Or, let MacInTax quickly and accurately read income and deductions from your Quicken records and directly transfer that data to your tax forms. Click on any total and MacInTax displays the supporting list of every transaction from Quicken comprising that total.

Know Your Financial Situation in Seconds

Quicken gives you detailed reports such as budget vs. actual comparisons, income and expenses by category, accounts payable, accounts receivables, or P&Ls, on screen or on paper, almost instantaneously.

The World's #1 Selling **Financial Software**

Here's why Quicken is the world's most popular:

Quicken is a great program... Its combination of an outstanding implementation of the Mac interface, sophisticated keyword-searching techniques, and a readable, well-designed manual make it the and a reasurer, industry standard. \$\$\$\$\$ __Ken Landis, MacUser

Absolutely the best small accounting program made. -Bob Schwabach, Universal Press Syndicate

No Accounting Mumbo Jumbo

Quicken is as easy as the pen and paper you use now. You'll see the familiar checkbook and check register right on your screen. The only thing that changes is how fast you finish your financial chores. This is bookkeeping that's totally hassle-free.

For Personal and Business Use

No other financial software provides more flexibility to handle the wide range of personal or business needs. Quicken is for service and manufacturing businesses, doctors, consultants, designers and retailers, as well as for households. Quicken is ideal for anyone who wants relief from bookkeeping hassles.

Specifications
Software Compatibility: Exports data in SYLK format for use in spreadsheets like Excel Exports data to HyperCard.
Hardware Compatibility: All Mactinosh with 512K RAM. All printers,
including laser printers. Also available for IBM and compatibles. Apple IIe,
IIe, Ite Plus, and IIGS.
Capacity: Unlimited number of bank accounts. Unlimited number of
transactions. Unlimited number of income/expense categories. Maximum
sequence 16, 80.090.090.09.

mounts to \$9 000 000 00

amounts to 39,999,999.
Other: Unlimited FREE technical support. Not copy-protected. Checks are preapproved by all financial institutions in the U.S. and Canada. Sample checks and order form are enclosed in Quicken package.

Try Quicken FREE for 30 Days

Order Quicken today from the coupon below, or through our toll-free 800 number. If you're not completely satisfied with Quicken for any reason, simply return it for a full, no-questionsasked refund.





I want to try Quicken on your no-risk 30-day guarantee. If I'm not completely satisfied, I may return it within 30 days for a full refund. Quicken, \$49.95 plus \$3.00 shipping and handling. California residents add sales tax.

Call 800-624-8742

Name	
Address	
City	State
ZipPh	one
☐ Macintosh version	□ 3½" disk
☐ Apple II version	□ 5¼" disk
☐ Check enclosed (no pure	hase orders, please)

Card No

Expiration Date

540 University Avenue Palo Alto, California 94301 MW 0489



"Congratuations to everyone involved in producing MiniCad+. Combined with the MiniCad Plotter driver, this is definitely a System for design, drafting, analysis, and production of drawings on the Macintosh. The add-ons like macros, on-screen spreadsheet, hierarchical symbol editing and other improvements amount to a professional CAD program presented in a well documented manual, which I was glad to see in binder form...I have investigated other CAD programs....notably VersaCad and I don't think any of these have any advantage over MiniCad+. In terms of options and attributes MiniCad+ definitely has an edge over all others."....B. St-Jean, National Museum, Canada

"MiniCad+...is in our opinion, in power per dollar the best CAD program for the Mac...I think one of the best new features is the MiniPascal command language."...John S. Gates, AIA

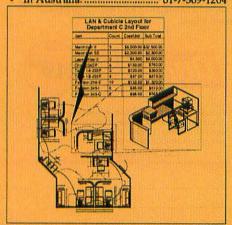
"I have been using MiniCad+ for some weeks now and I must say it is a fantastic improvement on the last release of MiniCad. I particularly like the new 3D features which are easier to use"...Andrew Herron, Herron Associates

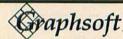
Act now Only: \$695 Demo: \$19.00

- · Mastercard & Visa accepted
- · Call or write today to order:

Graphsoft • 8370 Court Ave., Ste. 103A, Ellicott City, MD 21043

In USA:	301-461-9488
In Canada:	604-380-6911
In Australia:	61-7-369-1204





Macintosh Plus, SE, II &, IIX are trademarks of Apple Computer Inc.

Circle 77 on reader service card

We need someone with the with the confidence of a surgeon, the dedication of a marathoner and the courage of an explorer.

We need someone to fill a unique job opening.

Someone to spend two years in another country. To live and work in another culture. To learn a new language and acquire new skills.

We need someone who wants to help improve other people's lives. Who's anxious to build lasting friendships. To gain memories and experience that will last a lifetime. And a sense of fulfillment few jobs can match.

We need a Peace Corps volunteer. Interested? The first step is easy. Call 1-800-424-8580, Ext. 93.

Peace Corps.

The toughest job you'll ever love.

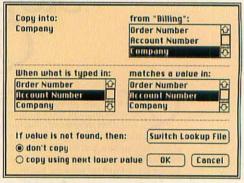


How To/Insights

the record with a matching account number, then copy the name and address from the found record into the name and address fields of the record you're working on. This is a good feature but it requires two files; the working file and the lookup file.

You can avoid maintaining two files by getting FileMaker to look inside the current file and copy the desired information into fields in a new record. In this case, when you type the lookup trigger into the lookup field, the program searches all the records in the *active* file for a match. If a match is found, the data is pasted into the new record. Here's how it's done.

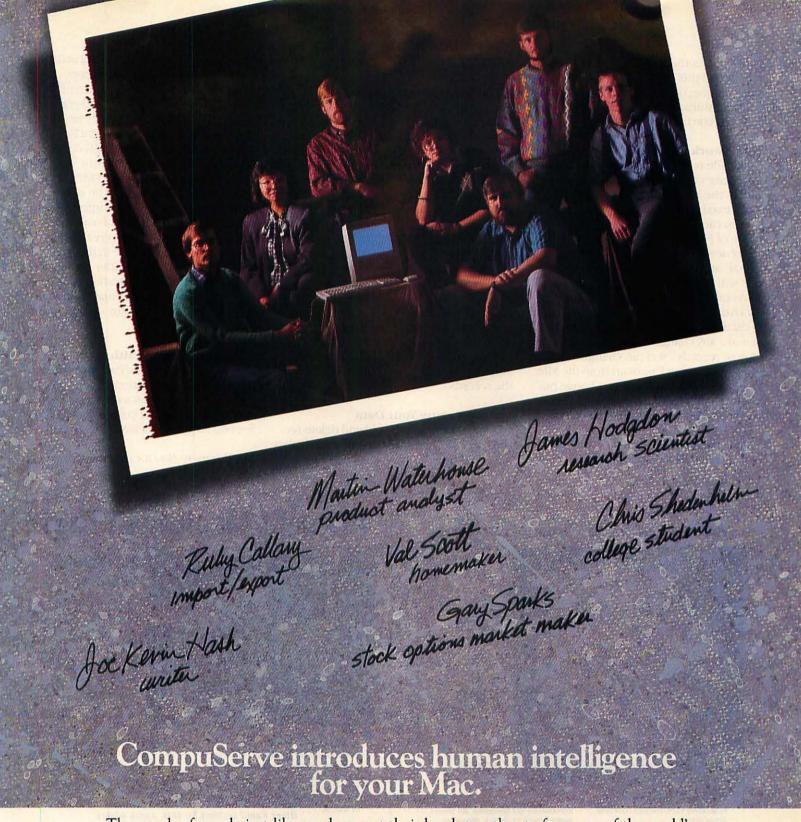
Go to the Define mode in the Select menu in the file you're using, and choose a field such as Company. Click on the Entry Options button, then click on the "Look up value from another file" check box in the resulting dialog box. When the usual file-selection box appears, select the name of the file in which you are working. The lookup definition dialog box appears, which lets you choose the fields you want copied (see "Look Inside"). Repeat this process for all other fields you want to be automatically filled in.



Look Inside

This is the usual lookup definition dialog box, but with a twist. The active file, Billing, is also selected as the lookup file. This allows you to use existing records in the same file for automatic data entry. In this case the company information is added into a new record whenever its account number matches that of an existing record.

Now, when you type in an account number that matches the account number in a previous record, FileMaker will copy the specified data from the previous record into one or more fields in the new record.



Thousands of people just like you have put their heads together to form one of the world's most advanced data processors—CompuServe's Mac* Forums. And they'd like you to join them.

Forum members share problems and solutions on our bustling message center. They access and contribute to huge data libraries teeming with the best shareware and public domain software anywhere. And they take on the latest computing topics in live, online conferences.

Nothing can make your Mac as intelligent or as friendly as CompuServe's Forum members.

To join CompuServe, see your computer dealer. To order direct or for more information, call 800 848-8199. If you're already a member, type GO MACINTOSH at any! prompt.

CompuServe

CompuServe

Be careful that the field you use as the trigger value (in this case the account number) is unique; otherwise you could end up with unwanted data pasted into the new record.

Network Niceties

If a file is not being shared over a network, make certain the Exclusive command in the File menu is on (checked) to ensure maximum speed of all operations.

You can create a kind of runtime version of FileMaker II by designating the level of access for some users as "Browse records" and "Edit records" only. Such users will be able to add, modify, and delete records, but not to modify or design new layouts, fields, or scripts. If users need the database for reference only and will not make any changes, limit them to "Browse records." You can change access rights by choosing Password from the File menu, clicking on the New or Change button, and then selecting the appropriate access rights from the resulting dialog box.

Keyboard Crazy

Here are a few quick hints to help you

utilize some of FileMaker's many keyboard shortcuts.

- When you tab through fields in existing records, FileMaker positions the insertion point at the end of the text already in the field. Rather than pressing Backspace repeatedly to delete the text, press Shift-Clear to clear the field.
- Pressing the Option key in conjunction with # key menu equivalents suppresses confirmation dialog boxes. For example, \$\mathbb{H}\$-Option-E deletes records without warning, so use this feature carefully.
- FileMaker lets you hide the book icon used to move between records, giving you more space for screen layouts. Click on the Screen Width icon at the lower-left corner of the screen to hide the book. Use the # -Tab keys to move forward from record to record without using the icon. Pressing Shift- # -Tab moves you backward through the records.

Squeezing Your Data

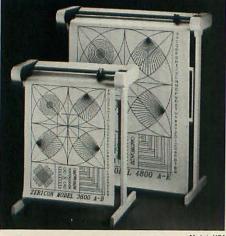
Over time, as you add and delete records, a FileMaker database grows and takes up more disk space than its data actually needs. Using the Compressed copy option on the Save A Copy menu can dramatically reduce the amount of space a file takes up on the disk, which is especially important if you're using the program on a floppydisk system. I squeezed a 463K database down to 328K using this feature. Two caveats, though: compressing a file can take quite a while; and you must be sure to have as much free space on the target disk as the size of the original database while the compressed copy is being created. File-Maker can compress a file in the background when running under MultiFinder, but the foreground application runs considerably slower than normal. Compressing a file also speeds many operations in large databases.

Sharing the Wealth

If you've found a shortcut or undocumented trick not mentioned here, spread the word to other Macworld readers by sending it to Quick Tips, Macworld, 501 Second St., San Francisco, CA 94107.

See Where to Buy for contact information.

Affordable Large Format Plotting



C-D \$1695 (Sugg. ret. \$2295)

A-D\$2295 (Sugg. ret. \$2695)

A-E\$2695 (Sugg. ret. \$2995)

Made in USA

Features that say value...

Economical: \$1,000 less than other large format plotters

Compatible: Operates with all popular CAD software supporting DM/PL.

Multiple Media Sizes as small as 81/2" x 11" or as large as 36" x 48" eliminates the need for a second plotter.

Practical speed you can really use: 10" per second assures good drawing throughput while optimizing the speed at which most plotter pens can draw without skipping.

Repeatability and Resolution: .004 assures quality suitable for the most demanding applications including PCB artwork.

Vacuum Paper Hold Down guarantees perfect registration.

CALL NOW AND WE'LL SEND YOU A FREE SAMPLE PLOT. (415) 490-8380

Dealer inquiries invited.

ZERICON 40491 Encyclopedia Circle, Fremont, Ca 94538

DM/PL is a trademark of Houston Instrument

Circle 267 on reader service card

Prevent Macintosh Theft!



EXCLUSIVE!

Proprietary components (Pat. Pend.) permit only your key to release Mac-Kablit. When ordering multiple units, specify locks to be keyed differently Specify Mac, Mac Plus SE, or Mac II.

ing security slots on the keyboard and computer and existing screws in other peripheral equipment. The system includes 2 brackets for the security slots plus unique Kablit fasteners for peripherals. Cable passes through Kablit fasteners, preventing removal of

MacKablit System

Heavy duty 10' steel cable

(7 x 19) secures and locks

nents. The unique Mac-Kablit system incudes 2 brackets that snap into existing slots on the Mac-

intosh keyboard and computer. Additional hardware

included for other Mac peripherals (disk drive,

printers). The unique Mac-Kablit system utilizes exist-

computer, printer, equipment, up to 4 compo-

Other Kablit systems for IBM, Apple, others.



\$39.95 + \$3.00 shipping/handling

Quantity pricing also available for multiple purchases from schools, institutions, businesses, industrials, etc. Send P.O.



Money back if returned in 30 days. Phone or send check.

Secure-It, Inc.

18 Maple Court East Longmeadow, MA 01028 800-451-7592 413-525-7039 Dealer Inquiries Invited

Circle 239 on reader service card

Before you give your next presentation, press this button.

Turn Desktop Presentations Into Conference Room Power

Your Macintosh® is one of the best tools around for creating great presentation images. Now VideoShow® can take those images into the conference room where you'll really impress your audience with high-resolution presentations in up to 100,000 brilliant colors on screen. And it's as easy as pressing a button.

Create your images with your favorite graphics or presentation software like Microsoft® PowerPoint™, Aldus® Persuasion™, Symantec™ MORE II™, etc. Then

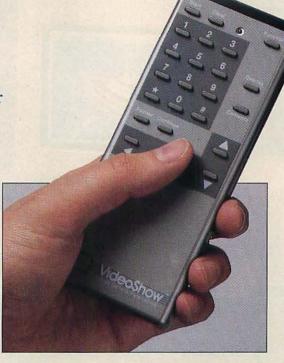
take your presentation diskette from your Macintosh into the conference room. Insert it into VideoShow and press the button.

VideoShow turns your images into exciting, boardroom-quality presentations with dynamic transition effects, all in brilliant full color. Even if you've created your images on a Mac® SE or Plus.

And your Macintosh can remain in your office while you're in the conference room. Just connect VideoShow to a color monitor or large-screen video projector. Insert your presentation disk, and press the button.

Easy On Your Budget

With three models, starting at \$1795, there's a VideoShow unit to fit every budget and presentation



VideoShow's wireless remote control puts you in complete command of your presentation.

need. And VideoShow can operate as the cornerstone of a full system for creating presentations in a variety of media.

Brilliant Slides, Too

When you need professional quality high-resolution slides, simply add Photo-Metric® SlideMaker® to turn your great images into great slides. At your desk. No guesswork. No service bureaus. No delays. No problems.

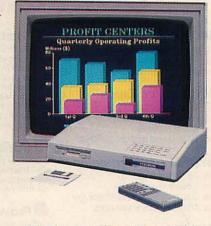
And Instant Overheads

VideoShow with Print-

Maker® software and a color printer, produces sharp,

brilliantly colored overhead transparencies and hardcopy handouts. Easily and instantly.

You have to see VideoShow to believe it. Call today 800-556-1234, ext. 234. In California, call 800-441-2345, ext. 234.



VideoShow is an electronic presentation unit for outstanding conference room presentations.

General Parametrics Corporation The leader in desktop presentation products

Trademark/Owner: Aldus, Persuasion/Aldus Corporation; Mac, Macintosh/Apple Computer, Inc.: PhotoMetric, PrintMaker, SlideMaker, VideoShow/General Parametrics Corporation; Microsoft, PowerPoint/Microsoft Corporation; MORE II, Symantec/Symantec Corporation.



COREL Macintosh WORM Drives

WORM's vs Floppies

- 1000 times capacity
- Hard drive speed Hard drive speed
 Rugged cartridges

WORM's vs Tapes

- 12 times capacity
- Hard drive speed
- More reliable
- More reliable
 Withstand airport X-Rays

■ WORM's vs Bernoullis

- 20 times capacity
- Lower cost/Mbyte
- State of the art technology
- Multiple drive vendors

WORM vs Erasables

- Proven technology
- No accidental erasure

- Lower cost/Mbyte Ideal for archiving/audit Proven life for media
- Available NOW!

Total MacCompatiblity

COREL WORM drives are 100% Macintosh compatible and use the familiar Mac icon interface. Use them just like your floppy or hard drive. COREL software enables the WORM to appear erasable so you can delete files as usual. Files can be saved and retrieved individually or in bulk, and you have the benefit of full recovery at any time.

COREL Leads the Industry

COREL is the World leader in Optical disk interfacing software and uses this vast experience to provide seamless optical subsystems.

Proven Software

COREL has led the way in 51/4" WORM drive software with many thousands of installations.

Proven Hardware

COREL uses proven drive mechanisms from the leaders of the industry such as Panasonic, Ricoh and Pioneer.

Dozens of Applications

- Hypercard databases
- Digitized sound
- Multi-media applications
- Virus protection for data LAN file servers

- Archiving (Ultra long life) Back-up/Multiple copies Graphics/CAD libraries
- Image files
- Software libraries
- Full Text retrieval Medical scanned images
- Audit trails
- CD-Rom development
- Data distribution Unix applications

Other Systems Available COREL WORM subsystems available for:

- IBM PC
- Novell LAN fileservers
 3COM LAN fileservers
- UNIX (Available early 1989)

Plug and Play

Everything you need is included: Drive, Software, Cable, and Manual. Your WORM can be running minutes after opening the box.

Hot Line & Bulletin Board

Just in case you have any problems, COREL provides total support to find the solution quickly and efficiently.

Choice of Drives

- COREL 400M 400 Mbyte (2 x 200/side) Cartridges
 - \$115 COREL 600M \$3,795

\$2,895

\$180

\$3,995

- 600 Mbyte (2 x 300/side) Cartridges
- COREL 800M 800 Mbyte (2 x 400/side) Cartridges

Order Now From COREL

No delays, you will receive your drive within a few days of your order.



Updates

This list brings you the highlights of software updates recently received but not yet tested. The first price is the upgrade cost for registered owners; the second is the current list price.

Aldus FreeHand version 2.0 supports color, has new fills and blending features for text and graphics. User interface has been changed to more closely resemble that of Aldus PageMaker. Contains Undo and Redo options and built-in color separator. Aldus, 411 First Ave. S, #200, Seattle, WA 98104; 206/628-6674. \$85; \$45 for extended technical support subscribers; \$25 if originally purchased after September 14, 1988; \$495 new.

FreeFlow version 3.0 works with AppleShare and TOPS LANs and is compatible with VAX-based software that emulates Macintosh LANs. Includes unlimited definition length, an element to diagram cross-reference lists, and the ability to define data structures for primitive elements. Automatically adds component dataflows to the dictionary when a definition is saved; has global rename and delete functions. Iconix Software Engineering, 2800 28th St., #230, Santa Monica, CA 90405; 213/458-0092. Free; \$995 new.

HyperEngine Developer's Tool

version 1.1 supports background commands and display of custom fonts and icons. Text is justifiable using buttons. This version incorporates all HyperTalk object abbreviations added to HyperCard. Symmetry Corp., 761 E. University, Mesa, AZ 85203; 800/624-2485. Free; \$125 plus \$5 s/h new.

Language Systems Fortran version 1.2 eliminates the size limit on single subroutines and the limit on number of Include files. Compiler has added feature that automatically breaks large programs into segments. Speed increase of approximately 5 percent overall, 20 percent for complex calculations. Language Systems, 441 Carlisle Dr., Herndon, VA 22070; 703/478-0181. \$35 if originally purchased before September 12, 1988; \$15 if originally purchased after; \$345 including Macintosh

MacTell version 3.5 adds color support for the Mac II. Baseline, 838 Broadway, New York, NY 10003; 212/254-8235. \$50; free if originally purchased after August 1, 1988; \$97 new.

Programmer's Workshop

(MPW) new.

MarketMaster version II+ has profile screen, new sequencing of letters, revised help screen, online help, and can set up envelopes to run off LaserWriter or ImageWriter. Breakthrough Productions, 10659 Caminito Cascara, San Diego, CA 92108; 619/281-6174. \$25; \$295 for MarketMaster only; \$395 with Results Analysis new.

Monte Carlo version 2.0 consists of Statistical Analysis, Simulation, and Long Term Projection modules. Makes producing statistics for up to 10 variables per model less complex than in previous version, and allows up to 100 variables per model. Actuarial Micro Software, 8025 N. Point Blvd., #215E, Winston-Salem, NC 27106; 919/773-1313. \$45 if originally purchased before June 30, 1988; \$60 after; \$495 new until June 30, 1989; \$595 after.

More II version 2.0 creates multipleline headlines, previews pages in three views, has context-sensitive help feature, and produces a variety of tree charts. Supports multiple-monitor presentations and desktop film recorders. Onscreen control panel is designed to monitor pace of live presentations. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014-2132; 408/253-9600. \$89 plus \$10 domestic s/h, \$25 Canadian s/h; \$395 new.

(continues)

Multi-User Appointment Diaries

version 3.0.1 opens diaries on a network at up to 5 seconds faster than previous version. Has Week at a Peek and Month at a Peek features. Can print range of days, weeks, or months. Has Undo feature; supports color. Includes Smart Alarms version 2.9.1. Jam Technologies, 685 Market St., #860, San Francisco, CA 94105; 415/442-0795. \$22 for 1 to 4 users with original disk; \$199 for 1 to 4 users new (contact vendor for additional prices).

Read-It OCR version 2.0 allows you to scan pages directly from the scanner. Supports all Apple, H-P, Microtek-engine, and Cannonengine scanners. Includes feature for type-table building; can do batch processing for files with different type tables. Olduvai, 7520 Red Rd., Ste. A, South Miami, FL 33143; 305/665-4665. \$24 if originally purchased before November 1, 1988; \$6 after that; \$395 new.

Sales Associate version 1.10 has password protection, increased options for form letters, \$\mathbb{8}\$-key shortcuts. Program can load and save multiple form letters to disk. Performs searches 50 to 100 percent faster than earlier versions. Metropolis Software, 499 Hamilton Ave., #202, Palo Alto, CA 94301; 415/322-2001. Free; \$395 new.

Smart Alarms version 2.9.1 includes one-hour snooze button on the DA. five-minute snooze button on the reminder dialog box. Compatible with System 6.0.2 and MultiFinder. Reminders can be printed; user controls when and how alarm beeps. Diary has Week at a Peek and Month at a Peek features: prints range of days, weeks, or months; and supports Undo and color. Jam Technologies, 685 Market St., #860, San Francisco, CA 94105: 415/442-0795. \$12 with original disk: \$99 new.

SmartScrap & The Clipper version 2.0 supports color and gray-scale in the Scrapbook, searches on individual Scrapbook pages, and has a lasso tool. Adds the ability to correct marquee selections pixel by pixel. Scrapbooks display individual names. Includes automatic scrapbook-building program. Solutions International, 30 Commerce St., Williston, VT 05495; 802/658-5506. \$20; \$89.95 new.

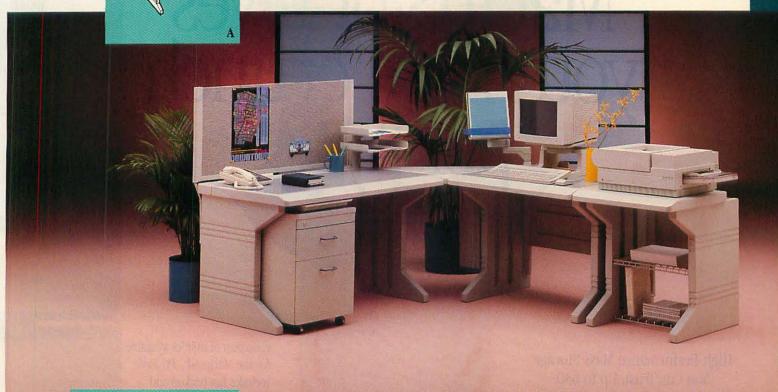
Talking Moose version 2.1 runs as an INIT file. Built-in utility program has phrase editor and exceptions editor so you can change the way specific words are pronounced. Has option to selectively turn off Moose's speech. Includes a game called Bird Race. Steve Halls, 3837 Luther Pl., #303, Saskatoon, Saskatchewan, Canada S7H 4B1; 306/374-6052. Free for owners of version 2.0; \$20 new.

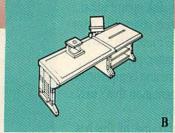
Think's Lightspeed Pascal version 2.0 has multipass optimizing compiler; supports Object Pascal for object-oriented programming. Handles any program size, contains language extensions for increased compatibility with Macintosh Programmer's Workshop (MPW). Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014-2132; 408/253-9600. \$49 plus \$3.50 s/h; \$149 new.

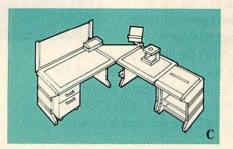
WriteNow version 2.0 performs mail merge in Microsoft Word—compatible format; includes dictionary; imports and exports direct text, MacWrite, and RTF (Rich Text Format) files. Includes full cursor-key support, fixed line spacing, and decimal tab; has the ability to change cases. Prints in forward or reverse direction. T/ Maker, 1390 Villa St., Mountain View, CA 94041; 415/962-0195. Free if originally purchased after January 15, 1988; \$50 if purchased before; \$195 new. □

To have products listed in this section, send upgraded software, an outline of major changes since the previous release, upgrade price, suggested retail price, company name, mailing address, and phone number to Updates, Macworld, 501 Second St., San Francisco, CA 94107.

Right, it's efficient. Right, it's great looking. Costs an arm and a leg, right?







Wrong.

If you think you can't afford computer workstation furniture as up-to-date as your Macintosh, think again.

Breakthrough prices. The basic workstation (drawing A) costs less than \$305. For under \$635, you can set up the intermediate workstation (drawing B). And the full featured workstation (drawing C and photo) is less than \$1300. Since the WorkManager™ System is modular, you can start small and add on as your needs—and resources—grow.

Breakthrough design. The WorkManager™
System has the ergonomics of high-priced
designer furniture systems. The work surface

is the perfect typing height for Mac keyboards, and features a comfortable beveled leading edge. A covered, recessed channel holds cables and surge protectors. Built-in sockets handle WorkManager™ accessories.

Breakthrough construction. Strong, lightweight structural components are molded of steel reinforced Resinite™ composite. Moldedin color makes surfaces highly scratch resistant.

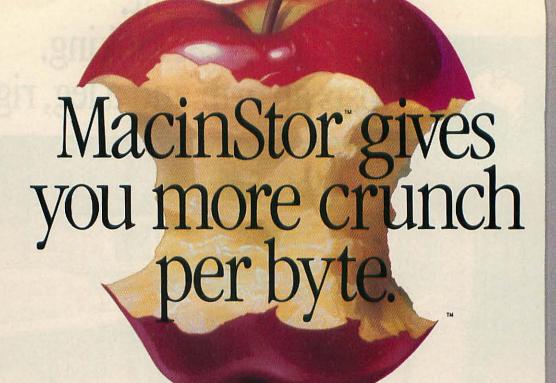
The WorkManager™ System. For people who need workstations as advanced as their computers—from the people at MicroComputer Accessories, Inc.

WORKMANAGER[™]

MicroComputer Accessories In







High-Performance Mass Storage You Can Trust. Up to 630 Megabytes, Internal or External.

Macintosh users have many storage subsystems to choose from. Now, there's a family of products that meets the high-capacity and high-performance demands of today's storage-intensive Mac® applications.

Introducing the MacinStor*high-performance family from Storage Dimensions. MacinStor comes with everything you'd ever want in a storage subsystem. And a few things you never thought possible.

To satisfy your hunger for high per-

formance, MacinStor delivers capacities up to 630 MB on a single hard disk (internal

or external), data transfer rates as high as 15 Mbits/sec., and seek times as fast as 14 milliseconds. Nobody crunches data faster. This

MacinStor.

STORAGE DIMENSIONS

Migh-performance philosophy is maintained

External fincluding zero footprint) 3.5 or 5.25 Inch subsystems. throughout our

product line. All the way down to our 45 MB drives.

MacinStor comes with a complete, easy-to-use and install package of disk management software. You get *PC Tools*, the most complete collection of utilities available for the Macintosh. *PC Tools* includes fast backup and restore, disk optimization, data encryption, data recovery and more. You also get a formatter, partitioning software and comprehensive documentation that's easy to follow.

Of course, all this has its price. And it's amazingly low. Especially when compared to what you get—or don't get—with other storage subsystems.

Now's the time to put more into your Mac. So you can get more out. For the name of your nearest authorized MacinStor dealer, call (408) 879-0300 today. He'll give you more to chew on.



Storage Dimensions, 2145 Hamilton Avenue, San Jose, CA 95125.

MacinStor is a trademark of Storage Dimensions. ©1988 Storage Dimensions.

Where to Buy

This listing provides company addresses and phone numbers for products mentioned in this issue. Allow several weeks for responses to Reader Service Card inquiries. Asterisks indicate vendors who prefer to be contacted by phone.

Reader

- 751 Adobe Illustrator 88. Adobe Systems, Inc., P.O. Box 7900, Mountain View, CA 94039-7900; 415/961-4400, 800/833-6687.
- 752 Alchemy. Blank Software, 1477 Folsom St., San Francisco, CA 94103; 415/863-9224.
- 753 Aldus FreeHand. Aldus Corp., 411 First Ave. S, Seattle, WA 98104; 206/622-5500.
- 754 AnyGraph. Compatible Systems Corp., P.O. Drawer 17220, Boulder, CO 80308; 303/444-9532, 800/356-0283.
- 755 AnyText. Compatible Systems Corp., P.O. Drawer 17220, Boulder, CO 80308; 303/444-9532, 800/356-0283.
- 756 Apple File Exchange. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.
- 757 Apple Hard Disk 1608C. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.
- 758 Apple Portrait Display. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.
- 759 Apple Workstation Display. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.
- 760 Apple PC 5.25 Drive. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.
- 761 Arkanoid. Discovery Software International, Inc., 163 Conduit St., Annapolis, MD 21401; 301/268-9877.

0

- 762 Canvas. Deneba Software, 3305 N.W. 74th Ave., Miami, FL 33122; 305/594-6965, 800/622-6827.
 - Chipendale. True Basic, Inc., 12 Commerce Ave., West Lebanon, NH 03784; 603/298-8517, 800/872-2742.
- 763 CLR StatCalculator. Clear Lake Research, 5615 Morningside, #127, Houston, TX 77005; 713/523-7842.
- 764 ConcertWare+. Great Wave Software, Inc., 5353 Scotts Valley Dr., Scotts Valley, CA 95066; 408/438-1990.
- 765 Cricket Draw. Cricket Software, Inc., 40 Valley Stream Pkwy., Malvern, PA 19355; 215/251-9890.
- 766 Cricket Paint. Cricket Software, Inc., 40 Valley Stream Pkwy., Malvern, PA 19355; 215/251-9890.
- 767 The Curator. Solutions International, 30 Commerce St., Williston, VT 05495; 802/865-9220.

0

- 768 Data Desk Professional. Odesta Corp., 4084 Commercial Ave., Northbrook, IL 60062; 312/498-5615.
- 769 DaynaFile. Dayna Communications, Inc., 50 S. Main St., 5th Fl., Salt Lake City, UT 84144; 801/531-0203, 800/531-0600.
- 770 DaynaFile Translation Software. Dayna Communications, Inc., 50 S. Main St., 5th Fl., Salt Lake City, UT 84144; 801/531-0203, 800/531-0600.
- 771 Deluxe Music Construction Set. Electronic Arts, P.O. Box 7530, San Mateo, CA 94403; 415/571-7171, 800/245-4525.
- 772 Different Drummer. Primera Software, 650 Cragmont Ave., Berkeley, CA 94707; 415/525-3000.
- 773 DiskExpress. ALSoft, Inc., P.O. Box 927, Spring, TX 77383-0927; 713/353-4090.
- 774 DX7 II/TX802 Editor/Librarian. Opcode Systems, Inc., 1024 Hamilton Ct., Menlo Park, CA 94025; 415/321-8977.

(3

- 775 Excel Statistical Macro Package. Heizer Software, 1941 Oak Park Blvd., #30, Pleasant Hill, CA 94523; 415/943-7667.
- 776 The FileMaker Report. Elk Horn Publishing, P.O. Box 126, Mountain View, CA 95004; 408/726-3148.
- 777 FileMaker II. Claris Corp., 440 Clyde Ave., Mountain View, CA 94040; 415/960-1500, 800/334-3535.
- 778 Font/DA Juggler Plus. ALSoft, Inc., P.O. Box 927, Spring, TX 77383-0927; 713/353-4090.
- FontDisplay. Jeffrey Shulman, P.O. Box 521, Ridgefield, CT 06877-0521; 203/792-1521.
 FontLiner. Taylored Graphics, P.O. Box 1900, Freedom, CA 95019-1900; 408/761-2481.
- 780 Fontographer 2.4.1. Altsys Corp., 720 Avenue F, #109, Plano, TX 75074; 214/424-4888.
- 781 FontSizer. U.S. MicroLabs, Inc., 1611 Headway Cir., Bldg. 3, Austin, TX 78754; 512/339-0001, 800/552-7654.
- 6
 782 Gofer. Microlytics, Inc., One Tobey Village Office Park, Pittsford, NY 14535; 716/248-9150, 800/828-6293.
- 783 HB Music Engraver. HB Imaging, 560 S. State St., Orem, UT 84058; 801/225-7222.
- 784 HD20-WSI. Personal Computer Peripherals Corp., 4710 Eisenhower Blvd., Bldg. A, Tampa, FL 33634; 813/884-3092, 800/622-2888.
- 785 HyperCharger 020. GCC Technologies, 580 Winter St., Waltham, MA 02154; 617/890-0880, 800/634-9737.

Where to Buy

Reader Service

- 0
- * Infinity 10. Peripheral Land, Inc., 47800 Westinghouse Dr., Fremont, CA 94538; 415/657-2211.
 - 0
- 786 Jam Factory. Intelligent Music, 116 N. Lake Ave., Albany, NY 12206; 518/434-4110.
 - * Jam Session. Brøderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903-2101; 415/492-3200, 800/527-6263.
 - 0
- 787 KCS Level II. Dr. T's Music Software, 220 Boylston St., Chestnut Hill, MA 02167; 617/969-6657.
 - 0
- 788 LapLink Mac. Traveling Software, Inc., 18702 N. Creek Pkwy., Bothell, WA 98011; 206/483-8088, 800/343-8080.
- 789 Laser FX. Postcraft International, Inc., 27811 Avenue Hopkins, #6, Valencia, CA 91355; 805/257-1797.
- 790 LetraStudio. Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653; 201/845-6100, 800/526-9703.
- 791 LetrTuck. EDCO Services, Inc., 12410 N. Dale Mabry Hwy., Tampa, FL 33618; 813/962-7800, 800/523-8973.
- 792 Listen. Resonate, Inc., P.O. Box 996, Menlo Park, CA 94026; 415/323-5022.
- 793 LP Text. London Pride, Inc., 1 Birch St., Norwalk, CT 06851; 203/866-4806.

- 794 M. Intelligent Music, 116 N. Lake Ave., Albany, NY 12206; 518/434-4110.
- 795 MacADIOS. GW Instruments, Inc., 35 Medford St., Somerville, MA 02143; 617/625-4096.
- 796 Mac86. AST Research, Inc., 2121 Alton Ave., Irvine, CA 92714-4992; 714/863-1333.
- 797 Macintosh IIcx. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.
- 798 Mac286. AST Research, Inc., 2121 Alton Ave., Irvine, CA 92714-4992; 714/863-1333.
- 799 MacKern. ICOM Simulations, Inc., 648 S. Wheeling Rd., Wheeling, IL 60090; 312/520-4440.
- 800 MacLink Plus. DataViz, Inc., 35 Corporate Dr., Trumbull, CT 06611; 203/268-0030.
- 801 MacLink Plus Translators. DataViz, Inc., 35 Corporate Dr., Trumbull, CT 06611; 203/268-0030.
- 802 MacSpin. D2 Software, Inc., 5609-B Adams Ave., Austin, TX 78756; 512/454-7746.
- 803 Master Juggler. ALSoft, Inc., P.O. Box 927, Spring, TX 77383-0927; 713/353-4090.
- 804 Master Tracks Pro. Passport Designs, Inc., 625 Miramontes St., Half Moon Bay, CA 94019; 415/726-0280.
- 805 MathType. Design Science, Inc., 6475-B E. Pacific Coast Hwy., Long Beach, CA 90803; 213/433-0685.
- 806 MGM Station. Micro CAD/CAM, Inc., 5900 Sepulveda Blvd., Van Nuys, CA 91411; 818/376-0008.
 - * Microsoft File. Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717; 206/882-8080, 800/426-9400.
 - Microsoft Works 2.0. Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717; 206/882-8080, 800/426-9400.
- 807 MindWrite Express. Access Technology, Inc., 200 Heritage Harbor, Ste. G, Monterey, CA 93940; 408/648-4000.
- 808 Monte Carlo Simulations. Actuarial Micro Software, 8025 North Point Blvd., #215E, Winston-Salem, NC 27106; 919/773-1313.
- 809 Music Mouse. Opcode Systems, Inc., 1024 Hamilton Ct., Menlo Park, CA 94025; 415/321-8977.

O

- 810 NetBridge. Shiva Corp., 155 Second St., Cambridge, MA 02141; 617/864-8500, 800/458-3550.
 - NS8/16 Memory Expansion Board. National Semiconductor Corp., P.O. Box 58090, Santa Clara, CA 95052-8090; 408/721-5000, 800/538-8510.

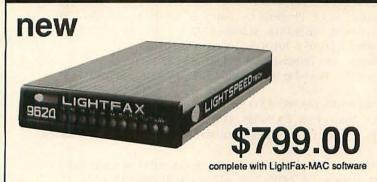
0

- 811 Orion SE. MacPeak Systems, 1201 Spyglass, Austin, TX 78746; 512/327-3211, 800/225-7509.
- 812 Orion II. MacPeak Systems, 1201 Spyglass, Austin, TX 78746; 512/327-3211, 800/225-7509.

P

- 813 PageMaker. Aldus Corp., 411 First Ave. S, Seattle, WA 98104; 206/622-5500.
- 814 Perfectstudy. Powerware Systems, 755 N. 100 W, Orem, UT 84057; 801/224-5033, 800/336-6644.
- 815 Performer. Mark of the Unicorn, Inc., 222 Third St., Cambridge, MA 02142; 617/576-2760.
- 816 P51 Mustang Flight Simulator. Bullseye Software, P.O. Drawer 7900, Incline Village, NV 89450; 702/265-2298.
- 817 Practica Musica. Ars Nova Software, Box 40629, Santa Barbara, CA 93140; 805/564-2518, 800/445-4866.
 - Prodigy 4. Levco, 6160 Lusk Blvd., #C-203, San Diego, CA 92121; 619/457-2011.
- Professional Composer. Mark of the Unicorn, Inc., 222 Third St., Cambridge, MA 02142; 617/576-2760.
 Pro-Tech Computer Paper and Film. James River Corp., 356B Sewall St., Ludlow, MA 01056; 413/589-7592.
- 819 QMS ColorScript 100. QMS, Inc., 1 Magnum Pass, Mobile, AL 36618; 205/633-4300, 800/631-2692.
- 820 QuarkStyle. Quark, Inc., 300 S. Jackson, #100, Denver, CO 80209; 303/934-2211, 800/356-9363.
- 821 QuarkXpress. Quark, Inc., 300 S. Jackson, #100, Denver, CO 80209; 303/934-2211, 800/356-9363.
- 822 QuickShare. Compatible Systems Corp., P.O. Drawer 17220, Boulder, CO 80308; 303/444-9532, 800/356-0283.

your MAC + LightFax 9624 FaxModem = the World at your fingertips



It's a state-of-the-art, external, high-speed fax and a 2400 baud 100% Hayes™ compatible modem. LightFax 9624 turns your Mac into a powerful world communication machine at a lower cost than a standard fax. Plus it offers sophisticated capabilities not found on standard fax machines, including document composition/editing, file storage, name card data management, scheduled sending (when the phone rates are cheaper), broadcasting (sending documents to multiple addresses), file queuing (sending multiple files), etc. LightFax 9624 has BACKGROUND OPERATION, that is you don't have to quit your application for your MAC to receive a fax. With optional LightSpeed 200 dpi scanner you can scan documents into your MAC, for fax transmission or for use with your favorite paint program. Use

LightFax 9624 also with your PC, with optional software. Finally click the mouse and your LightFax 9624 becomes a 2400 baud modern with Bell & CCIT standards for worldwide standards compatibility. To learn more about all the exciting capabilities of LightFax 9624 consult your nearest Apple dealer or call us for information.

Never buy another ribbon !!!

Special Offer: FREE MOUSEPAD or a PhotoArt Disk with any order >60.00, a \$12.00 value

Over 100,000 sold since 1982



MacInker

\$42.00

Imagewriter I & II MacInker, complete with free bottle of ink, reservoir cover and ink meter/dispenser.

DATA SWITCHES



MS4-MAC8, 4 port 8 pin DIN-8 connectors MS4-MAC9, 4 port 9 pin connectors SCSI Switch 2 port	50.00
MS4-MAC9, 4 port 9 pin connectors	50.00
SCSI Switch 2 port	46.00
SCSI Switch 4 port	59.00
Cables	16.00

Order Toll Free 800-547-3303

in Oregon (503)626-2291- fax(503)643-5379

Immediate shipment - 30 days money back guarantee

Computer Friends, Inc. 14250 NW Science Park Dr. Portland OR 97229 MacInker™, the original, automatic ribbon re-inker. The Imagewriter MacInker (mod 234IM) re-inks Imagewriter I/II black & single color cartridges. The Universal MacInker also re-inks hundreds of different cartridge types (including the Imagewriter LQ) with suitable adaptors. Extra dark, dot matrix, lubricated ink yields a truly better than new print quality and extends print-head life. New feltless dispenser ensures precise ink metering. Number of re-inkings/cartridge is 60-100. With the Multicolor Adaptor (mod M422, \$40.00) MacInker can re-ink the multicolor Imagewriter II cartridges. We have a full range of optional accessories, inks & cartridges, indelible ink, heat transfer etc. Colors: red, green, blue, yellow, purple, brown, orange, silver, gold. Ask for free catalog. In 1982 we pioneered re-inking technology and are dedicated to its development.

Imagewriter I/II MacInker (mod 234IM)	42.00
Multicolor Adaptor (mod M422)	40.00
Heat Transfer Adaptor	
Epson MacInker (mod 271EP)	42.00
Epson MacInker (mod 271EP) Universal Cartridge MacInker	68.50
Imagewriter cartridges3.15/ea	4-color10.00/ea
Heat Transfer cartridges	9.00/ea
Extra ink bottle3.00/ea	pint18.50

Macintosh Disks 3.5" DS (pack of 10)1	5.00
Mouse Pad (sale) Classic PhotoArt collection (5 disks)5	5.00
Classic PhotoArt collection (5 disks)5	9.00

Moby	Dick	120	wall	disk	holder	39.95
						49.95



MODEMS



All our modems are100% guaranteed Hayes™ compatible and have a 2 year warranty. Full front panel lights, auto answer,dial, repeat, call progress monitoring and speaker control. Superior signal to noise ratio and noise rejection. Includes software

1200 AT 300/1200 baud	99.00
Mercury 2400 baud (also supports Europe V21,V22)	
Capricorn World Minimodem, 300/1200 baud, pocket size	
Bell 103/212A & European CCIT V21,V22 standards	.136.00
Cable Mac to Modem (specify Macintosh type)	16.00
QuickLink™ Software (if purchased separately)	29.95

Where to Buy

Reader Service

823 Radius Accelerator 25. Radius, Inc., 404 E. Plumeria Dr., San Jose, CA 95134; 408/434-1010.

824 Radius Full Page Display SE Video Interface. Radius, Inc., 404 E. Plumeria Dr., San Jose, CA 95134; 408/434-1010.

825 Radius Two Page Display SE Video Interface. Radius, Inc., 404 E. Plumeria Dr., San Jose, CA 95134; 408/434-1010.

826 RATS. VAR Econometrics, Inc., P.O. Box 1818, Evanston, IL 60204-1818; 312/864-8772.

827 ReadySetGo. Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653; 201/845-6100, 800/526-9703.

828 Rembrandt II. Jasmine Technologies, Inc., 1740 Army St., San Francisco, CA 94124; 415/282-1111.

829 Roland D-110 Editor/Librarian. Dr. T's Music Software, 220 Boylston St., Chestnut Hill, MA 02167; 617/969-6657.

830 Scanmaster. Howtek, Inc., 21 Park Ave., Hudson, NH 03051; 603/882-5200.

831 Sequencer. Opcode Systems, Inc., 1024 Hamilton Ct., Menlo Park, CA 94025; 415/321-8977.

832 Sharp JX-450 Color Scanner. Sharp Electronics Corp., P.O. Box 650, Sharp Plaza, Mahwah, NJ 07430; 201/529-8979, 800/526-0264.

833 Smartmodem 2400 M. Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348; 404/441-1617.

834 Sonata. Adobe Systems, Inc., P.O. Box 7900, Mountain View, CA 94039-7900; 415/961-4400, 800/833-6687.

835 Sound Accelerator. Digidesign, Inc., 1360 Willow Rd., #101, Menlo Park, CA 94025; 415/327-8811.

836 Sound Designer. Digidesign, Inc., 1360 Willow Rd., #101, Menlo Park, CA 94025; 415/327-8811.

Spectrum/24. SuperMac Technology, 295 N. Bernardo Ave., Mountain View, CA 94043; 415/964-8884.

837 Speed Reader II. Davidson & Associates, Inc., 3135 Kashiwa St., Torrance, CA 90505; 213/534-4070, 800/556-6141.

838 StarDrive 60TX. Ruby Systems, Inc., 188 S. Whisman Rd., Mountain View, CA 94041; 415/967-1187, 800/888-1668.

839 StatView 512+. BrainPower, Inc., 30497 Canwood, #201, Agoura Hills, CA 91301; 818/884-6911, 800/345-0519.

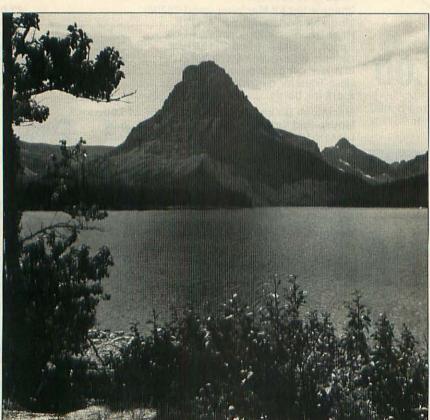
840 StatView SE+Graphics. Abacus Concepts, Inc., 1984 Bonita Ave., Berkeley, CA 94704; 415/540-1949.

841 StatView II. Abacus Concepts, Inc., 1984 Bonita Ave., Berkeley, CA 94704; 415/540-1949.

842 Stepping Out II. Berkeley System Design, Inc., 1708 Shattuck Ave., Berkeley, CA 94709; 415/540-5536.

843 Studio Session. Bogas Productions, 520 Cashew Ct., San Ramon, CA 94853; 415/829-2444.

America is worth fighting for.



From the Atlantic to the Pacific, the Arctic to the Gulf, our land is constantly under attack from the polluters and despoilers.

That's why Sierra Club Legal Defense Fund attorneys are pursuing dozens of cases nationwide in defense of wildlife, rare habitats, the air we breathe and the water we drink.

Most of our support comes from individual contributors like you. Please help us win. Because America is worth fighting for.

I enclose my tax-deductible contribution to save what I love most about America. Send me your quarterly newsletters in return.

NAME

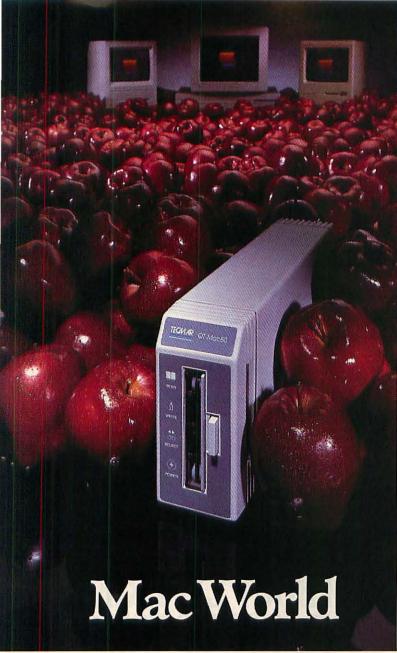
ADDRESS

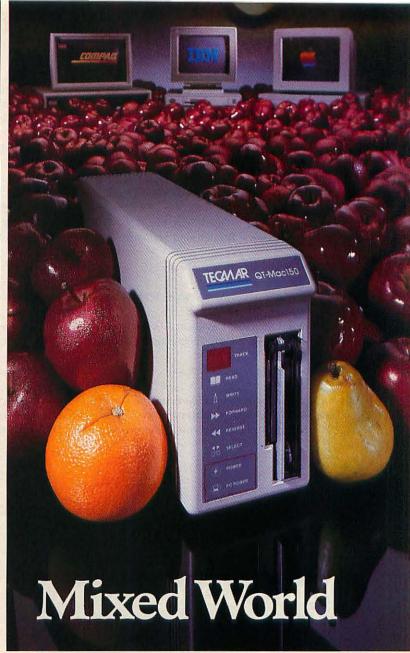
CITY

STATE

ZIP

Sierra Club Legal Defense Fund 2044 Fillmore, San Francisco, CA 94115





Tecmar Offers You The Best Tape Backup For Both

Regardless of what world you live in, Tecmar delivers the dependable, cost-effective tape backup systems you're seeking.

Mac World

Tecmar's QT-Mac80™ and QT-Mac40™ are the proven choice for SCSI tape backup for the pure Mac environment, with network support for effective backup and archiving under TOPS,® AppleShare® and Novell.® Including our exclusive QuickTurn™ Quality Service and two-year warranty, you couldn't ask for a better Mac tape backup solution.

Applications Guide

		Apple* Macintosh*			IBM®/ Compatible		
	Plus	SE	11	IIX	PC	PS/2"	
QT-Mac40 40MB SCSI	Ó	Ó	6	*			
QT-Mac80 80MB SCSI		•	6				
QT-Mac150* 150MB			0	-	0		
NuLink Interface			6	Ú		100	

*Bundled with NuLink for total MacII solutions. PC and PS/2 hos

TECMAR

Mixed World

We've even bridged the gap between PC Bus, Micro Channel™ Bus and NuBus™ with our new QT-Mac150™ and NuLink™ interface board, which now, for the first time ever, give you a single-drive solution for mixed environments.

So get the best for both worlds. For the name of your nearest dealer, call us today at **(216)** 349-1009 or toll-free at **(800)** 624-8560. Tecmar, Inc., 6225 Cochran Road, Solon, Ohio 44139-3377.

All Tecmar products are trademarks or registered trademarks of Tecmar, Inc. Other brand and product names are trademarks or registered trademarks of their respective companies.

©Copyright Tecmar, Inc., a subsidiary of Rexon, Inc., 1989. All rights reserved.

Circle 321 on reader service card

A REXON COMPANY

Where to Buy

Reader

- Suitcase II. Fifth Generation Systems, Inc., 11200 Industriplex Blvd., Baton Rouge, LA 70809; 504/291-7221, 800/225-2775.
- Super Jupiter Librarian. Opcode Systems, Inc., 1024 Hamilton Ct., Menlo Park, CA 94025; 415/321-8977.
 - SuperLaserSpool. SuperMac Technology, 295 N. Bernardo Ave., Mountain View, CA 94043; 415/964-8884.
- Symantec Utilities for the Macintosh. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014; 408/253-9600. 846
- Systat. Systat, Inc., 1800 Sherman, Evanston, IL 60201; 312/864-5670.

- Tax Stacks. StackWorks, Inc., P.O. Box 426, Urbana, IL 61801; 217/328-5257. 848
- 33/030 Accelerator II. DayStar Digital, Inc., 5556 Atlanta Hwy., Flower Branch, GA 30542; 805/388-2626, 800/622-6829.
 - TrueSTAT. True Basic, Inc., 12 Commerce Ave., West Lebanon, NH 03784; 603/298-8517, 800/872-2742.
- Turbosynth. Digidesign, Inc., 1360 Willow Rd., #101, Menlo Park, CA 94025; 415/327-8811.
 - TypeStyler. Brøderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903-2101; 415/492-3200, 800/527-6263.
- Intelligent Music, 116 N. Lake Ave., Albany, NY 12206; 518/434-4110. 851 UpBeat.

- Carina Software, 830 Williams St., San Leandro, CA 94577; 415/352-7328. 852 Voyager. W
- Word Attack. Davidson & Associates, Inc., 3135 Kashiwa St., Torrance, CA 90505; 213/534-4070, 800/556-6141. 853
- WriteMove. GCC Technologies, 580 Winter St., Waltham, MA 02154; 617/890-0880, 800/634-9737.

Messenger Software, Inc., 20202 Center Ridge Rd., #5, Rocky River, OH 44116; 216/333-9936. □ 855 xFer.

Public domain software and shareware are available through online information services; user groups (call 800/538-9696 ext. 500 for information on a local user group); or mail-order clearinghouses such as Budgetbytes (800/356-3551 for orders, 913/271-6022 in Kansas), Educomp (800/843-9497, 619/259-0255 in California), or the Public Domain Exchange (800/331-8125, 408/496-0624 in California).

Danny Goodman on

Why struggle with a manual when you can learn from a TV set? Let the master of HyperCard show you the quick and easy way to learn. From the basics to advanced techniques, you'll see every step discussed and demonstrated.

Created by Danny Goodman and the publishers of MACWorld. Satisfaction Guaranteed. Usually \$49.95. SAVE \$5 by ordering no later than June 15. Pay only \$44.95. Use coupon or call (800) 333-0901. Clip and mail now.

NAME

ADDRESS

CITY

STATE

MC/VISA/AMEX(circle one)

Daytime Phone

VHS or Beta

ZIP

Send check or money order payable to Sterling Group PO Box 750, Bristol, RI 02809. Add \$3.95 for S&H (\$5.95 outside US).

Struggle with a Manual?

Circle 94 on reader service card

HOW DO YOU GETA JO

Most young people have one answer to this problem. They avoid it until they're out of college. But they could be getting solid work experience while they're still in college. With your company's help. And ours.

We're Co-op Education. A nationwide program that helps college students get real jobs for real pay, while they're getting an education.

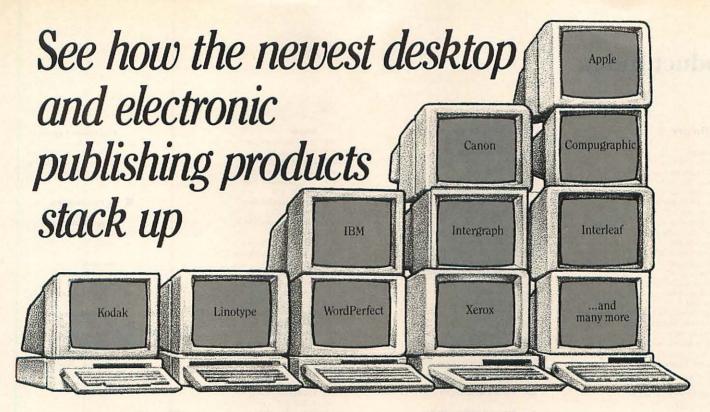
But we can't do it without you. Those real jobs have to

come from real companies. Like yours.

For more information on how you can participate in this valuable program, write Co-op Education, Box 775E, Boston, MA 02115.

Not only will you be giving students a chance to earn money and pick up the most valuable kind of knowledge, you'll be giving yourselves a chance to pick up the most valuable kind of employee.

You earn a future when you earn a degree.



Talk to leading vendors at CEPS '89

At CEPS '89, you can update your knowledge, examine products, ask questions and get solutions—right on the spot. Both the show and the conference act as a learning resource.

CEPS is the national show designed for the FORTUNE 1000 as well as the midsize, document-intensive company. Now in its fifth year, CEPS features a *full range* of products and services from top names in the industry.

And now, as an annual event, CEPS is your *one opportunity* to meet your peers, get answers from technical salespeople, and discover all that's available to you in electronic publishing.

Use the attached coupon—and come to CEPS—the show and conference for desktop and electronic publishing.

For Conference Program and Show information call (203) 964-8287.

CEPS**89
Corporate
Electronic
Publishing
Systems**

The Show and Conference

May 16-18, 1989 McCormick Place North Chicago, IL

SAVE \$15!

Bring this ad to CEPS '89 for discount show registration.

With this ad, you pay only \$10. (Regular registration fee, \$25.)

For additional discount registrations, bring photocopies of this ad.

S

Product Index

Reader Service Number

Software

- Advanced Gravis, 195 Antic Publishing, Inc., 236
- 220 Ashton Tate, 38-39
- Automatix, 222
- Berkeley System Design, 26
- Caere Corp, 197 426
- 365 Ceres Software, 61
- Checkmark Software, 220
- Claris, 150-151
- Design Science, 218
- Dow Jones, 195
- 155 Dubl-Click, 180
- GreenSpring Computers, 86
- Informix Software, 214-215 360
- Intuit, 243
- Micro Planning Int'l., 33 Microseeds Publishing, 210 366
- Microsoft, IFC-1
- Multi Solutions, Inc., 226
- Paragon Concepts, Inc., 8
- Personal Training Systems, 175
- SBT, 205
- Shana Corporation, 240
- Silicon Beach Software, 98
- 215 Symantec, 12
- Symantec, 9
- 492 Systat, 168
- Systat, 168 491
- TBSP, 56 135
- Williams & Macias, 60

- Adobe Systems, 208
- Checkmark Software, 220
- 50 Micro Planning Int'l., 33
- 456 SBT, 205
- 135 TBSP, 56

Data Management

- Acius, 36
- Fox Software, 223 152
- Oracle, 59 ProVue, 21

Word Processing

- 49 Allan Bonadio, 230
- Ashton Tate, 38-39 220 Claris, 150-151
- Design Science, 218
- Paragon Concepts, Inc., 8
- Personal Training Systems, 175
- Round Lake Publishing, 61
- Symantec, 12
- 332 T/Maker, IBC

CAD/CAM

- Autodesk, 188-189
- Claris, 10-11
- Graphsoft, 244
- 151 Innovative Data Design, 157

Communication

- Dataviz, 233
- 436 Pinnacle Micro Inc., 82
- TOPS, 65
- TOPS, 231
- White Pine Software, 60

Educational

- Design Science, 218
- Personal Training Systems, 175

Reader Service Number

Graphics/Desktop Publishing

- Adobe Systems, 208
- 401 Advanced Gravis, 195 Aldus Persuasion, 30-31 306
- Automatix, 222 428
- Ceres Software, 61
- Computer Friends, 234
- Deneba Software, 41
- 282 Deneba Software, 43
- Dubl-Click, 180
- 467 General Parametrics Corp., 247
- GW Instruments, 20
- 337 Image Club, 164
- Innovative Data Design, 157 Intercontinental Computer
- Services, 204
- NuEquation, 203
- Paracomp, 213
- Quark, 92
- Qume, 62-63 353
- Qume, 62-63 115
- 297 Shana Corporation, 240
- 266
- Silicon Beach Software, 98 Solutions International, 202 405
- Springboard Software, 170
- 185
- US Microlabs, 232 448 Williams & Macias, 60 238

Personal Business/Home

- Intuit, 243
- 297 Shana Corporation, 240
- Survivor Software, 58
- 238 Williams & Macias, 60

Entertainment

- 219 Centron Software, 32
- PCAL 22 291

Networking

- Farallon Computing, 80
- Shiva, 5
- TOPS, 65 TOPS, 231

Utilities

- AlSoft, 42
- Antic Publishing, Inc., 236 446
- Derkeley System Design, 26
- Central Point Software, 159
- Deneba Software, 45
- First Aid Software, 210
- 439 GDT Softworks, 44 366
- Microseeds Publishing, 210 Olduvai, 64 284
- Symantec, 9 237 XTree, 161

Miscellaneous

- Caere Corp, 197
- Central Point Software, 159 357 Checkmark Software, 220

■ Hardware

Printers

- Compugraphic, 23-25
- GCC Technologies, 15
- Hewlett-Packard, 72-73
- Hewlett-Packard, 74-75 344
- Jasmine, 229 Laser Connection, 184 102 104
- Lasergraphics, 270 322
- Orange Micro, 32 Orange Micro, 66
- Qume, 62-63
- 115 Qume, 62-63 Varityper, 94-95

Reader Service Number

Boards

- American Micro Distributors, 212
- Clearpoint, 235
- Clearpoint, 235 Daystar Digital, 216
- Dove Computer Corp.
- (Mac II), 173 Dove Computer Corp.
- (Fastnet), 173
- Irwin Magnetics, 162-163
- 161 Micron, 179
- Mobius Technologies, 197 196
- National Semiconductor, 219 Novell, 198-199
- Raster Ops, 88-89 13
- Supermac, 16-17 Truevision, 179

- Digitizers/Scanners
- Caere Corp, 197
- Thunderware, 40 Xerox Imaging Systems, 193

- Display E-Machines, 68-69
- In Focus Systems, 186 586
- Mac Friends, 206 354
- Radius, 6-7 46
- Radius, 60A-60D Sigma Designs, 84

- Modems
- Computer Friends, 255
- 421 Shiva, 5 Ven-Tel, 57 469

- Hard Disks/Storage American Micro Distributors, 212
- Corel Systems, 248
- Ehman Engineering, 90
- Everex, 70 110
- Hard Drives International, 180
- 457 Jasmine, 46 145 LaCie, 18
- Mac Friends, 206 354
- MicroNet, 207 398
- 275 MicroNet, 207 Microtech International, 27
- Microtech International, 155
- Microtech International, 29
- Mirror Technologies, 34-35 424 223 PCPC, 182
- Pinnacle Micro Inc., 82
- 149 Rodime, 211
- Seagate, 191
- 416 Storage Dimensions, 252

Tecmar, 257

- Computer Friends, 234
- General Parametrics Corp., 247
- Raster Ops, 88-89 Supermac, 16-17

Miscellaneous

American Micro Distributors, 212 Computer Friends, 255

Lasergraphics, 270

Farallon Computing, 80 In Focus Systems, 186

Zericon, 246

Orange Micro, 66 Trimar USA 212

- Expansions/Upgrades Micron, 179
- Software Security Devices

Accessories

Floppy Disks/Holders

Rainbow Technologies, 177

140

239

293

Maxell, 54

- Furniture
- Anthro Corp, 28 ScanCo., 96

- Walker Company, The, 44 Miscellaneous
- Cahner's Expo Group, 259
- Computer Friends, 255 1/O Design, 4 385
- Kensington Microware Ltd., BC Kensington Microware Ltd., 221
- Macworld Expo, 291
- Micro Computer Accessories, 251
- ScanCo., 96 296
- Secure-it, 246
- Compuserve, 245 GE Information Services, 209
- MacAcademy, 237
- Ouick Results, 258

Safeware, 228

- Mail Order
- Beverly Hills Computer, 266-267
- CDA, 208 562 Diskette Connection, 265
- Dr. Mac, Inc., 263
- 354 Mac Friends, 206 MacConnection, 100-107
- 264 MacLand, 269
- MacMillan Book Club, 225
- MacProducts USA, 268 MacWarehouse, 48-53
- Midwest Connect, 264 Multiple Zones Int'l., 238-239
- Programs Plus, 76-79 Software Library, 265 USA Flex/Comark, 262

Open Mac Enterprises, 261

MACWORLD	Please print or type all information.	Check this	601	602		G INFOR		ON 608 60	9 610
	Name Title	in the appropriate information to sub-	611	612 622	613 614 623 624	615 616 625 626	617 627	618 61 628 62	9 620 9 630
Free Product INFORMATION	Company	scribe to Macworld. You will be billed	641	642	633 634 643 644 653 654	635 636 645 646 655 656	647 657	638 63 648 64 658 65	19 650 59 660
Get more information on products you're interested in—simply return	Address City, State, Zip (zip code needed to ensure delivery)	\$24.00 for a 1-year (12-issue) subscrip-	671	672	663 664 673 674 683 684	665 666 675 676 685 686	677	668 66 678 67 688 68	79 680
one of these cards today. There's no cost. And no obligation.	Phone: Area code/Number	tion (U.S. only)	691 701	692 702	693 694 703 704	695 696 705 706	697 707	698 69 708 70	99 700 99 710
(1-200)	(201-400) (401-600)		711 721 731	722	713 714 723 724 733 734	715 716 725 726 735 736	727	718 71 728 72 738 73	29 730 39 740
11 12 13 14 15 16 17 18 19	10 201 202 203 204 205 206 207 208 209 210 401 402 403 404 405 40 20 211 212 213 214 215 216 217 218 219 220 411 412 413 414 415 413 30 221 222 223 224 225 226 227 288 229 230 421 422 423 424 425 42	6 417 418 419 420	741	742	743 744	745 746	747	748 74	
31 32 33 34 35 36 37 38 39 41 42 43 44 45 46 47 48 49	40 231 232 233 234 235 236 237 238 239 240 431 432 433 434 435 43 50 241 242 243 244 245 246 247 248 249 250 441 442 443 444 445 44	5 437 438 439 440 5 447 448 449 450	751 761	752 762	753 754 763 764	755 756 765 766	757		59 760 69 770
61 62 63 64 65 66 67 68 69	60 251 252 253 254 255 256 257 258 259 260 451 452 453 454 455 457 70 261 262 263 264 265 266 267 268 269 270 461 462 463 464 465 46 80 271 272 273 274 275 276 277 278 279 280 471 472 473 474 475 47	6 467 468 469 470	771 781	772 782	773 774 783 784	775 776 785 786	777 787	778 77 788 78	79 780 89 790
81 82 83 84 85 86 87 88 89	80 271 272 273 274 275 276 277 278 279 280 471 472 473 474 475 47 90 281 282 283 284 285 286 287 288 289 290 481 482 483 484 485 48 100 291 292 293 294 295 296 297 298 299 300 491 492 493 494 495 49	6 487 488 489 490	801	802	793 794 803 804 813 814	795 796 805 806 815 816	807	798 79 808 80 818 81	09 810
111 112 113 114 115 116 117 118 119 1	110 301 302 303 304 305 306 307 308 309 310 501 502 503 504 505 50 120 311 312 313 314 315 316 317 318 319 320 511 512 513 514 515 51	6 517 518 519 520	821 831	822 832	823 824 833 834 843 844	825 826 835 836 845 846	837	828 82 838 83 848 84	29 830
131 132 133 134 135 136 137 138 139 1	30 321 322 323 324 325 326 327 328 329 330 521 522 523 524 525 52 440 331 332 333 334 335 336 337 338 339 340 531 532 533 534 535 55 50 341 342 343 344 345 346 347 348 349 350 541 542 543 544 545 54	6 537 538 539 540	851 861	852 862	853 854 863 864	855 856 865 866	857 867	858 85 868 86	59 860 69 870
161 162 163 164 165 166 167 168 169 1		6 557 558 559 560 6 567 568 569 570 6 577 578 579 580	881 891	882 892	873 874 883 884 893 894	875 876 885 886 895 896	887 897	898 89	89 890 99 900
171 172 173 174 175 176 177 178 179 1 181 182 183 184 185 186 187 188 189 1 191 192 193 194 195 196 197 198 199 2	90 381 382 383 384 385 386 387 388 389 390 581 582 583 584 585 58	5 587 588 589 590	911	912	903 904 913 914 923 924	905 906 915 916 925 926	917	908 90 918 91 928 92	19 920
Expires 6/26/89	\$1	APRIL 1989	931	932	933 934 943 944	935 936 945 946	937	938 93 948 94	39 940
MACMODID	Please print or type all information.	Check this box and fill	-			G INFOR			
MACWORLD	Name Title	in the appropriate information to sub-	611 621	622	603 604 613 614 623 624	605 606 615 616 625 626	617 627	608 60 618 61 628 62	630
Free Product INFORMATION	Company	scribe to Macworld. You will be billed	641 651	642 652	633 634 643 644 653 654	635 636 645 646 655 656	647 657	638 63 648 64 658 65	19 650 59 660
Get more information on products you're interested in—simply return	Address City, State, Zip (zip code needed to ensure delivery)	\$24.00 for a 1-year (12-issue) subscrip-	671	672	663 664 673 674 683 684	665 666 675 676 685 686	677 687	678 67 688 68	79 680 89 690
one of these cards today. There's no cost. And no obligation.	Phone: Area code:Number	tion (U.S. only)	691 701 711	702	693 694 703 704 713 714	695 696 705 706 715 716	707	708 70	09 710
(1-200)	(201-400) (401-600)	2 407 409 400 410	721 731	722 732	723 724 733 734 743 744	725 726 735 736 745 746	737		29 730 39 740
11 12 13 14 15 16 17 18 19	10 201 202 203 204 205 206 207 208 209 210 401 402 403 404 405 40 20 211 212 213 214 215 216 217 218 219 220 411 412 413 414 415 41 30 221 222 223 224 225 226 227 228 229 230 421 422 423 424 425 42	5 417 418 419 420 5 427 428 429 430	_	146		ERE TO		140 15	2 700
41 42 43 44 45 46 47 48 49		6 447 448 449 450	761	762	753 754 763 764 773 774	755 756 765 766 775 776	767	758 75 768 76 778 77	69 770
61 62 63 64 65 66 67 68 69 71 72 73 74 75 76 77 78 79	70	6 467 468 469 470 6 477 478 479 480	781 791	782 792	783 784 793 794 803 804	785 786 795 796 805 806	787 797	788 78 798 79	
91 92 93 94 95 96 97 98 99 1	90 281 282 283 284 285 286 287 288 289 290 481 482 483 484 485 48 100 291 292 293 294 295 296 297 298 299 300 491 492 493 494 495 49 110 301 302 303 304 305 306 307 308 309 310 501 502 503 504 505 50	6 497 498 499 500	811 821	812 822	813 814 823 824	815 816 825 826	817 827	818 81 828 82 838 83	19 B20 29 B30
111 112 113 114 115 116 117 118 119 1 121 122 123 124 125 126 127 128 129 1	20 311 312 313 314 315 316 317 318 319 320 511 512 513 514 515 51 30 321 322 323 324 325 326 327 328 329 330 521 522 523 524 525 52	5 517 518 519 520 5 527 528 529 530	841	842	833 834 843 844 853 854	835 836 845 846 855 856	847 857	848 84 858 85	49 850 59 860
131 132 133 134 135 136 137 138 139 1 141 142 143 144 145 146 147 148 149 1 151 152 153 154 155 156 157 158 159 1	150	5 547 548 549 550 5 557 558 559 560	881	882	863 864 873 874 883 884	865 866 875 876 885 886	877 887	868 86 878 87 888 88	79 880 89 890
161 162 163 164 165 166 167 168 169 1 171 172 173 174 175 176 177 178 179 1 181 182 183 184 185 186 187 188 189 1	80 371 372 373 374 375 376 377 378 379 380 571 572 573 574 575 57	6 577 578 579 580	901	902	893 894 903 904 913 914	895 896 905 906 915 916	907	898 89 908 90 918 91	09 910
191 192 193 194 195 196 197 198 199 2 Expires 6/26/89	391 392 393 394 395 396 397 398 399 400 591 592 593 594 595 59 \$2	6 597 598 599 600 APRIL 1989	921 931	922 932	923 924 933 934 943 944	925 926 935 936 945 946	927 937	928 92 938 93 948 94	29 930 39 940
Expires 0/20/03		AT THE 1303				-			
MACMODIT	Please print or type all information.	Check this	COLUMN TO SERVICE SERV	116-11	CATALO	G INFOR	IMATI	ON	and the same
MACWORLD	Name Title	box and fill in the appropriate	611	612	603 604 613 614	605 606 615 616 625 626	607 617	608 60 618 61	09 610 19 620 29 630
Free Product INFORMATION	Company	information to sub- scribe to Macworld. You will be billed	631 641	632 642	633 634 643 644	635 636 645 646	637 647	638 63 648 64	39 640 49 650
Get more information on products you're interested in—simply return	Address City, State, Zip (zip code needed to ensure delivery)	\$24.00 for a 1-year (12-issue) subscrip-	661 671	662 672	653 654 663 664 673 674	655 656 665 666 675 676	667	668 66 678 67	69 670
one of these cards today. There's no cost. And no obligation.	Phone: Area cade:Number	tion (U.S. only)	691 701	682 692 702	683 684 693 694 703 704	685 686 695 696 705 706	697 707	698 69 708 70	79 680 89 690 99 700 09 710
(1-200)	(201-400) (401-600)	5 407 409 400 410	711 721	712	713 714 723 724 733 734	715 716 725 726 735 736	727	718 71 728 72 738 73 748 74	19 720
11 12 13 14 15 16 17 18 19		5 417 418 419 420 5 427 428 429 430	741	732 742	743 744	735 736 745 746 HERE TO		738 73 748 74	9 750
31 32 33 34 35 36 37 38 39 41 42 43 44 45 46 47 48 49	40 231 232 233 234 235 236 237 238 239 240 431 432 433 434 435 43	6 447 448 449 450	761	762	753 754 763 764	755 756 765 766	757 767	768 76	59 760 69 770
61 62 63 64 65 66 67 68 69 71 72 73 74 75 76 77 78 79	70	6 467 468 469 470 6 477 478 479 480	771 781		773 774 783 784 793 794	775 776 785 786 795 796	787	788 78	79 780 89 790 99 800
91 92 93 94 95 96 97 98 99	00 291 292 293 294 295 296 297 298 299 300 491 492 493 494 495 49	6 487 488 489 490 6 497 498 499 500 6 507 508 509 510	801	802	803 804 813 814 823 824	805 806 815 816 825 826	807 817	808 80 818 81 828 82	09 810 19 820
111 112 113 114 115 116 117 118 119 1 121 122 123 124 125 126 127 128 129 1	20	6 527 528 529 530	831 841 851	832 842 852	833 834 843 844 853 854	835 836 845 846 855 856	837	838 83 848 84	39 840
131 132 133 134 135 136 137 138 139 1 141 142 143 144 145 146 147 148 149 1 151 152 153 154 155 156 157 158 159	50 341 342 343 344 345 346 347 348 349 350 541 542 543 544 545 54 60 351 352 353 354 355 356 357 358 359 360 551 552 553 554 555 55	5 547 548 549 550 6 557 558 559 560	861 871	862 872	863 864 873 874	865 866 875 876	867 877		69 870 79 880
	170 361 362 363 364 365 366 367 368 369 370 561 562 563 564 565 56 180 371 372 373 374 375 376 377 378 379 380 571 572 573 574 575 57 190 381 382 383 384 385 386 387 388 389 390 581 582 583 584 585 58	6 577 578 579 580 6 587 588 589 590	881 891 901	882 892 902	883 884 893 894 903 904	885 886 895 896 905 906	897 907	898 89 908 90	99 900 99 910
191 192 193 194 195 196 197 198 199 2	00 391 392 393 394 395 396 397 398 399 400 591 592 593 594 595 59	6 597 598 599 600	921 931	922 932	913 914 923 924 933 934	915 916 925 926 935 936	927 937	918 91 928 92 938 93	29 930 39 940
Expires 6/26/89	\$3	APRIL 1989	941	942	943 944	945 946	947	948 94	49 950



NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

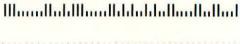
BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Reader Service Department P.O. Box 5299 Pittsfield, MA 01203-9906





BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

MACIAODIT

Reader Service Department P.O. Box 5299 Pittsfield, MA 01203-9906









BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Reader Service Department P.O. Box 5299 Pittsfield, MA 01203-9906





Advertiser Index

Reader Service Number		Reader Service Number	
	1-1 26		
	Acius, 36 Adobe Systems, 208	86	MacMillan Book Club, 225 MacProducts USA, 268
401	Advanced Gravis, 195	78	MacWarehouse, 48-53
306	Aldus Persuasion, 30-31	_	Macworld Expo, 291
49	Allan Bonadio Assoc., 230	_	Maxell, 54
202	AlSoft, 42	276	Micro Computer Accessories,
403	American Micro Distributors, 212	50	Micro Planning Int'l., 33
446	Anthro Corp, 28 Antic Publishing, Inc., 236	161 275	Micron Technology, 179 MicroNet, 207
_	Apple Computer, outsert	398	MicroNet, 207
220	Ashton Tate, 38-39	366	Microseeds Publishing, 210
454	Autodesk, 188-189	-	Microsoft, IFC-1
428	Automatix, 222	458	Microtech International, 29
479	BASF, 166	243	Microtech International, 155
187	Berkeley System Design, 26 Beverly Hills Computer, 266-267	62 441	Microtech International, 27 Midwest Connect, 264
426	Caere Corp, 197	424	Mirror Technologies, 150-151
345	Cahner's Expo Group, 259	413	Mobius Technologies, 197
32	CDA, 208	59	Multi Solutions, Inc., 226
357	Central Point Software, 159	70	Multiple Zones Int'l., 238-239
219	Centron Software, 32	196	National Semiconductor, 219
365	Ceres Software, 61	347	Novell, 198-199
	Checkmark Software, 220 Claris, 10-11	393 284	NuEquation, 203 Olduvai, 64
	Claris, 34-35	45	Open Mac Enterprises, 261
127	Clearpoint, 235		Oracle, 59
375	Clearpoint, 235	265	Orange Micro, 32
85	CMS, 200	575	Orange Micro, 66
_	Compugraphic, 23-25	213	Paracomp, 213
319	Compuserve, 245	253	Paragon Concepts, Inc., 8
61	Computer Friends, 255 Computer Friends, 234	291 223	PCAI, 22 PCPC, 182
233	Corel Systems, 248	42	Personal Training Systems, 175
40	Dataviz, 233	436	Pinnacle Micro Inc, 82
477	Daystar Digital, 216	44	Programs Plus, 76-79
282	Deneba Software, 43	451	ProVue, 21
	Deneba Software, 45	295	Quark, 92
217 165	Deneba Software, 41	94	Quick Results, 258
562	Design Science, 218 Diskette Connection, 265	353 115	Qume, 62-63 Qume, 62-63
173	Dove Computer Corp.	46	Radius, 6-7
	(Fastnet), 173	106	Rainbow Technologies, 177
174	Dove Computer Corp.	13	Raster Ops, 88-89
200	(Mac II), 173	149	Rodime, 211
355	Dow Jones, 195	293	Round Lake Publishing, 61
368 155	Dr. Mac, Inc., 263 Dubl-Click, 180	456	Safeware, 228 SBT, 205
452	Ehman Engineering, 90	296	ScanCo., 96
_	Educorp, outsert	_	Seagate, 191
110	Everex, 70	239	Secure-it, 246
101	E-Machines, 68-69	297	Shana Corporation, 240
150	Farallon Computing, 80	421 117	Shiva, 5
60 152	First Aid Software, 210 Fox Software, 223	266	Sigma Designs, 84 Silicon Beach Software, 98
177	GCC Technologies, 15	_	Software Library, 265
439	GDT Softworks, 44	405	Solutions International, 202
-	GE Information Services, 209	185	Springboard Software, 170
467	General Parametrics Corp., 247	416	Storage Dimensions, 252
77	Graphsoft, 244	-	Supermac, 16-17
430 124	GreenSpring Computers, 86 GW Instruments, 20	112 215	Survivor Software, 58 Symantec, 12
440	Hard Drives International, 180	237	Symantec, 9
344	Hewlett-Packard, 74-75	492	Systat, 168
343	Hewlett-Packard, 72-73	491	Systat, 168
337	Image Club, 164	135	TBSP, 56
586	In Focus Systems, 186	321	Tecmar, 257
360 151	Informix Software, 214-215 Innovative Data Design., 157	176	Thunderware, 40 TOPS, 65
38	Intercontinental Computer	_	TOPS, 231
	Services, 204	26	Trimar USA, 212
_	Intuit, 243	445	Truevision, 179
82	Irwin Magnetics, 162-163	332	T/Maker, IBC
385	I/O Design, 4 Jasmine, 220	448 54	US Microlabs, 232 USA Flex/Comark, 262
102 457	Jasmine, 229 Jasmine, 46	93	Varityper, 94-95
-192	Kensington Microware Ltd. 221		Ven-Tel. 57

XTree, 161

Zericon, 246

Walker Company, The, 44

White Pine Software, 60

Xerox Imaging Systems, 193

Williams & Macias, 60

140

192 Kensington Microware Ltd., 221

Laser Connection, 184

MacConnection, 100-107

Lasergraphics, 270

Mac Friends, 206

MacAcademy, 237

MacLand, 269

145

104

322

LaCie, 18

Kensington Microware Ltd., BC

Power for your MACINTOSH

MEMORY

48 Hour Shipment Guaranteed!

For Macintosh Plus, SE, II Ram II+II - Cost Effective **\$CALL**

4 Megabytes RAM, 120ns, CMOS.

ems, 175

Ram II- Cost Effective (No Mac II) Two 1 Megabyte SIMMs \$CALL

For Macintosh Plus

RamPlus 2- Cost Effective Expands to 2 Megabytes RAM. Plus Only

RamPlus 4-Expands to 4 Megabytes RAM, Plus Only

Reliable delivery for over 4 years!

We've reduced prices!

Call now to get your RAM upgraded.

VIDEO

NOW WITH GENLOCK!

Mac II to NTSC (Television) Converter Connect your Mac II to NTSC video.

Record your Macintosh images to video tape, or use for live presentations. Compatible with Apple & SuperMac Video Cards. The NEW GENLOCK Converter allows you to overlay Macintosh graphics onto video from a camera or VCR.

STANDARD

GENLOCK

\$999

Ask about our special Videoworks II offer!

Digitization

NEW!

RGB Converter

Converts standard video to RGB for your frame grabber or digitizer. Saves you \$1000's since RGB camera is no longer required.



The RGB Decoder eliminates the need for special camera equipment Call for more information!

All OPEN MAC products are Guaranteed:

- Are Manufactured by OPEN MAC Enterprise - Are User Installable - Preserve Manufacturer's Warranty - Carry a minimum 1 Year Warranty - Are stocked for rapid shipment - Are listed at a Cash Discount Price - Credit Cards not charged until shipment - Prices may vary

VISA/MC/AMEX/Discover Accepted

OPEN MAC Enterprises

415/682-0440- FAX: 415-686-4244

FORTUNE 1000 PURCHASE ORDERS ENCOURAGED 2280 Bates Avenue, Suite J, Concord, CA 94520

1989 OPEN MAC Enterprises. VideoEs, RamPius, Rom II, Rom II-III, VA Pius, VA SE are trademarks of Open Mac Enforcesoft is a registered trademark of Microsoft Corporation. Macintosh is atrademark of Apple Computer Incorporaceder. MISC Conventer, and GENICOK Conventer are trademarks of Julian Systems, inc. Videoworks II is a register demark of Macroninal Inc.

261

Circle 45 on reader service card



100 years of leadership in surface science technology goes into every KAO diskette — from raw materials to final packaging. You can be assured that every KAO diskette exceeds all worldwide industry standards

Boxed in Tens

100 +

31/2" SS 1K36A12

1K38A12

Rainbow Pack 5 colors per clear plastic box

Boxed in Tens 100+

400+

31/2" DS .. 1.65 1.54 ea.

1K38A11-RB Mac ● Pac **Bulk packaged in 50's**

31/2" DS 1.12 1.07 ea

Diskette labels 5° each, Minimum 50

EXTERNAL HARD DRIVES

20 Meg MAC

40 Meg MAC



Boxed in Tens

31/2" SS . . \$1.09 ea., 100+

31/2" DS . . \$1.39 ea., 100+ 1G38A12

MAC • PAC

Bulk Packaged in 50's

31/2" DS . . . 1.17 ea., 100+ 1H38A13

1.14 ea. 400 +

Diskette Labels 5¢ each Minimum 50

* 7 TO 7 CENTRAL M-F * 9 TO 2 SATURDAY *

1-800-872-3539

FAX# 312-351-7204

Minimum order \$100. No surcharge for handling additional

155 N. Brandon Drive, Glandale Heights, IL 60139

Circle 54 on reader service card

MAIL-ORDER CONSUMERS DO HAVE RIGHTS

The vendors and developers who advertise in the pages of ${f Macworld}$ share with us a common goal—to serve you, the consumer. And as a mail-order consumer, you have certain rights you should know and understand. Mail-order sales must comply with the rules of the Federal Trade Commission (FTC) and various state laws. Here are some guidelines to alert you to your rights and help you shop by mail more effectively.

THE FTC MAIL ORDER RULES STATE:

1. The Seller must ship your order within 30 days of receiving it, unless clearly stated otherwise in the advertisement.

If the Seller cannot ship your order when promised, you must be notified in writing prior to the promised date. The notice must specify a new date if available, and must give you the opportunity to (a) cancel with a refund; (b) agree to a specified delayed shipping date; or (c) agree to an indefinite delay.

3. The Seller's notice must include a postagepaid reply envelope or card so that you may indicate your preference. If you do not respond, the Seller may assume you agree to the delay.

4. Even if you agree to an indefinite delay, you retain the right to cancel at any time before the merchandise has been shipped.

5. If you cancel an order that has been paid by check or money order, the Seller is obligated to mail your refund within seven business days. If you paid by credit card, the Seller must credit your account within one billing cycle following receipt of your cancellation. Store credits or vouchers are not acceptable in place of a refund

6. If the item you order is unavailable, the Seller may not send you substitute merchandise without your consent.

DO'S AND DON'TS

By mail:

■ Compare prices, including sales tax and shipping tees, before you order. Your purchase may be exempt from sales tax—check your state laws on collection regulations. Handling, packing, and shipping fees are legal and most states tax these services.

State the precise specifications of the merchandise. such as model, make, size, component parts, etc.

■ Confirm the price and expected delivery date as advertised.

■ State on your order whether you will accept substitute merchandise if the item you specified is unavailable. If you won't accept a substitute, state that your payment should be returned.

■ Record of payment is essential if a problem arises. so do not send cash.

■ Keep copies of your order and all associated correspondence. Your records should include the company's name, address, and phone number, a description of the merchandise; your canceled check or money-order carbon, the date you mailed the order, and any sales slips and shipping receipts.

■ Do not insure your order. It is the Seller's responsibility to make sure you receive your merchandise

- Note the name of the person who takes your order. and the time and date of your conversation.
- Make a record of your order, the price, promised availability, and the expected components.
- Save all correspondence, including your canceled check or money-order carbon and any written confirmation sent by the Seller.

Questions to ask:

- Does the advertised merchandise include all necessary parts and accessories? Are they made by the same manufacturer? Is the version number or model number the same? Is the product compatible with the hardware/software you inlend to use it with?
- Can your order be shipped immediately? If not, when will it be available for shipping?
- Has the advertised price increased?
- What warranties does the merchandise carry? Who provides the service?
- What is the Seller's return policy? Exchange or repair? The refund policy?
- It a problem arises, with whom should you correspond?

PROBLEMS? SOLUTIONS:

L If you do not receive your order as promised or if the merchandise is defective, write to the Seller immediately. Include a description of your order, the price, date, and account number or order number if available. Keep a copy of your letter.

2. If you register your complaint by phone, send a follow-up letter to confirm and keep a copy of it.

3. If you think the merchandise is defective, review your product instructions and warranty carefully. Make sure you expect only those features and abilities that the product is supposed to have. Then contact the Seller for procedures. Do not return the merchandise until you have been instructed to do so.

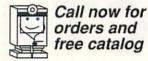
4. If you return the merchandise, keep the shipper's receipt or packing slip. Your right to reimbursement of postal costs is determined by store policy.

5. If you have discussed your problem thoroughly with the Seller and remain dissatisfied, write to the consumer complaint agency in the Seller's state. If you paid for the merchandise by credit card, you may have the right to withhold payment under the Federal Trade Commission's Fair Credit Billing Act.

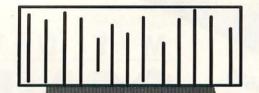
Macworld believes that the customer has a right to product and service satisfaction. If you continue to experience problems with mail-order purchasing, the President of Macworld Communications and the Editor-in-Chief of Macworld want to know about it. Please take a moment to write to: Jim Martin, President, Macworld Communications, or Letters to the Editor, Macworld, 501 Second Street, San Francisco, CA 94107. You may also phone the President at 415-243-0505 to discuss your situation. Our goal is to help you become a satisfied mailorder consumer.







1-800-825-MACS FAX • 1-818-501-3760



Examine Us!

Dr. Mac provides superior service.



Check this symbol for Dr. Mac's special prescriptions.

CALL 1-800-825-6227

Your Prescription For Success

SUPERMAC SOFTWARE

= SOFTWARE =
3G GRAPHICS
Images with Impact52 Images with Impact Business 65
ABA SOFTWARE Graphist Paint II
ADOBE SYSTEMS Adobe Illustrator '88
AEC Info Manager432
ALDUS Pagemaker 3.0
ALSOFT
ASHTON-TATE 69 FullPaint 275 dBase Mac 299
BEDFORD SOFTWARE Simply Accounting199
BERKELEY SYSTEMS Stepping Out II49
BRODERUND 8 1 Drawing Table 8 1 DTP Advisor 4 9 Print Shop 37
CAERE Omnipage550
CENTRAL POINT Copy II Mac
CENTRON SOFTWARE Casino Games
CE SOFTWARE QuicKeys 50 Calendar Maker 26 Disktop 26 Quickmail 153
CHANG LABS C.A.T. 2.0225
CLARIS MacDraw II 319 FileMaker II 235 MacProject II 388
COMPUSERVE Compuserve Navigator40
DATA VIZ Mac Link Plus103
DBFAST dBFast Mac115
DENEBA Canvas 2.0 150 Coach .51 Comment 2.0 .51 Coach Thesaurus .31 Coach Professional .99
DUBL CLICK SOFTWARE Wet Paint Vol. 1 & 2
E.K.D.

Fastback 59 Suitcase 43 Power Station 36
FOX SOFTWARE FoxBASE + / Mac
ICOM SIMULATIONS Tmon
IMAGINE SOFTWARE Smart Alarms & Appt. Diary32 Smart Alarms Multi-User79
INNOVATIVE DATA DESIGN Mac Draft
INTUIT Quicken33
LACIE Silver Server89
LETRASET Ready, Set, Go 4.0 275 Image Studio 275
MACROPAC INTERNATIONAL 101 Macros for Excel39
MARK OF THE UNICORN Performer
MECA Managing Your Money125
MICROSOFT MS Word248
Chart 92 Excel 250 File 2.0 137
File 2.0 137 Works 195 Flight Simulator 34 Power Point 259
Quick Basic 73
Power Point 259
Power Point
Power Point 259 Quick Basic 73 NOLO PRESS Will Maker 33 NORTHEDGE SOFTWARE Timeslips III 115 PRO PLUS Wall Street Investor 319 COULARK XPress 475 Style 175 SILICON BEACH SOFTWARE Super Paint 2.0 123 Dark Castle 26 Silicon Press 40 Bevond Dark Castle 26 Silicon Press 40 Bevond Dark Castle 26
Power Point
Power Folin

SuperSpool 5.0 52 SuperLaserSpool 2.0 79 Multi-User SuperLaserSpool 195 Disklit 52 Network Disklit 195 Sentinel 149 PixelPaint 249
SYMANTEC 46 Mac SQZ 46 In-Box Starter 199 Symantec Utilities 57 Lightspeed C 105 Lightspeed P 75 More II 224
SYMMETRY CORPORATION 39 Acta 2.0 39 HyperDA 38
TRAVELING SOFTWARE Lap Link Mac82
T - MAKER Write Now 2.0
TOPS TOPS for Mac
WORDPERFECT CORP. Wordperfect189
= HARDWARE =
ABATON Interlax Fax-modem324
CUTTING EDGE CE 800K Disk Drive 172 Wedge XL 30+ 595 Wedge XL 45+ 795
DATADESK Mac - 101149
BOVE COMPUTER CORP. 68020 Accelerator Boards for Mac MSE 1 550 MSE 2 1MB 975 MSE 3 Math Co-processor 734 MSE 4 1MB and Math Co-pro 1155 Acc. or MacIl Memory Exp. 459 Macsnap 1024 446 466 Macsnap 2B 734 Macsnap 2B 734 Macsnap 4H 1357 Macsnap 4S 1455 MacSnap Plus 2 446
Emac 20 DL - 38ms
FARALLON COMPUTING 136 Macrecorder 136 PhoneNET-AppleTalk 120 9 PhoneNET PLUS 35 PhoneNET Star Controller 1225 PhoneNET Punch Down Kit 68 Timbuktu 78 Timbuktu Remote 206 TrafficWatch 155
GENERAL COMPUTER Write Move
HARD DRIVE KITS 40 Meg. Kit (5 year warranty) 617

KENSINGTON Disk Drive Cleaning Kit
Macintosh II Stand
MASS MICRO Data Pak
PERIPHERAL LAND 30 Turbo - 14ms access time
PRACTICAL PERIPHERALS 1200 Baud External Modem
SAMSUNG 15 In. Monitor Mac II907 15 In. Monitor Mac SE842
SHARP JX-450 Color Scanner
SIGMA DESIGNS
LaserView 19 in SF 1500
Color Max II
Pageview Plus
SUMMAGRAPHICS Bit Pad Plus ADB325
SUPRA 2400 Baud External Modem 140
SYSTEMGATE 800K Floppy Drive159
TARGUS Mac Plus/SE Carry Case
THUNDERWARE ThunderScan 4.0 with Pwr Port .193 Mac II Power Accessory
SIMMS 1 Meg. 5 year Warranty289
POLICIES • Corporate Accounts Welcome. Please send
Purchase Orders Visa, Mastercard, and AMEX accepted.
Credit card is not charged until order is shipped California confidence and 6 F8/ pales to
California residents add 6.5% sales tax To order call Mon - Fri, 10 - 10 EST
Enquiries call (818) 501-6581, FAX# (818) 501-3760
All prices subject to change without notice. Shipping
All orders add \$5. UPS Blue
 Same day shipping on orders placed by 7pm EST, if items are on hand.
Returns
Defective software will be replaced
immediately by the same item. Call customer service at (818) 501-0861 for
R.A. number before returning defective

product.

Dr. Mac Inc. 14542 Ventura Blvd., Suite 200 Sherman Oaks, CA 91403

DR. MAC WELCOMES CORPORATE AND EDUCATIONAL ACCOUNTS

Connect your Macintosh to the Macintosh of America Heartland of America 1-800-541-4620

MII DIWEST

227 Main Street New Providence, Iowa 50206

ALSoft Disk Express......32.00 Beyond Inc. MenuFonts 2......36.00 **CE Software** Copy II Mac 7.2.19.50 **Farallon Computing** Screen Recorder 135.00 **FWB** Hard Disk Partition45.00 Kent Marsh MacSafe 88.00 NightWatch 1.02 88.00 Mac Master Microlytics Gofer ... Olduvai Softworks Super Glue ... Supermac Software Disk fit 1.453.00 Super Spool 5.0. 53.00 Super Laser Spool 2.0 80.00 Symantec



Generic Symbols Library (Generic Software) - Expand the capabilities of Generic CADD Level 1 with Generic Symbols Libraries' Basic Home De-sign, Bathroom Design, Commercial & Residential Furnishings, and Flow Charts & Schedules

DATA BASE MANAGEMENT

Blythe Software	
Omnis 3 Plus/Express	280.00
Fox Software	
Fox Base Plus Mac	208.00
Odesta	
Double Helix II	350.00
Preferred Publishers	
DAtabase	103.00
LANGUAGE	0
LANGUAGE	5

LANGUAGES
Symantic
Lightspeed Pascal 2.089.00
Lightspeed C 3.0112.00
Borland
Turbo Pascal
Microsoft
Quick Basic 65 00

6.44.493	
GAMES	
Activision	
Shanghai24	.00
Broderbund	
Ancient Art of War27	
Ancient Art of War at Sea27	.00
Bullseye	
Ferrari Grand Prix33	.00
Discovery Software	
Arkanoid	.00
Electronic Arts	
Chuck Yeager's Flight Simulator	.00
Greene Inc.	
Crystal Quest	.00
Infocom	
Beyond Zork 30	.00
Mindscape	
Balance of Power30	
Colony30	.00
Microsoft	
Flight Simulator32	.00
Practical Computer Applications	
MacGolf	
MacCourses	
MacRaquetball35	
Road Racer42	.00
Silicon Beach	
Dark Castle	
Beyond Dark Castle27	.00
Spectrum Holobyte	
Falcon 2.032	
Solitaire Royal20	.00
Toyogo, Inc.	
Nemesis The Go Master58	.00
EDUCATION & MUSIC	
Davidson & Associates	

Greatwaves Software

ConcertWare + MIDI	.79.00
Time Master	. 22.00
Kids Time	
Learning Company	
Reader Rabbit 2.0	. 33.00
Bright Star Technologies	
Alphabet Blocks	.32.00
Springboard	
Early Games for Young Children	.28.00
Easy as ABC	

DESKTOP PUBLISHING & WORD PROCESSIN

Cricket	-
Cricket Presents	276.00
Letraset	
Ready Set Go 4.0	279.00
LetraStudio	
Microsoft	
PowerPoint 2.0	255.00



Generic CADD Level 1 (Generic Software) - An excellent, easy to use drawing tool giving users true CADD capabilities including, 256 layers, floating point precision and bezier curves. \$89.00



Lunar Rescue (PCAI) - An addictive world of adventure that challenges your imagination and sets your adrenaline on fire. It's a spectacular action odyssey of battle and cunning strategy in the 21st \$29.00

Adobe Systems Inc.	
Adobe Illustrator30	9.00
ABA Software	
Draw It Again Sam 2.03	1.00
Broderbund	
Drawing Table7	9.00
Postermaker Plus 2.5	
Print Shop	6.00
Cricket Software	
Cricket Draw	9.00
Cricket Paint13	
CE Software	
MacBillboard2	3.00
Deneba Software	
Canvas 2.0	4.00
Dubl-Click	-
Wet Paint	
Volumes 1-16 (Each)4	3.00
World Class Fonts	
Volumes 1-6 (Each)4	7.00
Foundation Publishing	101-50
Comic People2	5.00
Comic Strip Factory	
Genesis Systems	7020
Advanced Visuals Vol. 1	5.00
Innovative Data Design Dreams28	2.00
Paracomp	
Swivel 3D	5.00
Silicon Beach Software	3,55
Digital Darkroom15	9.00
Super3D16	
Super3D Color	
3G Graphics	800707
Images With Impact	0.00

ACCESSORIES

Computer Coverup
Computer & Printer Coverscal
Datadesk International
Mac 101 (Mac Plus)
Mac 101 ADB Keyboard 134.00
Joystick SE - Mach IV54.00
Joystick Plus - Mach IV54.00
P.A.C.E.
MacCarry 63.00
Sony
Sony Disks DS-DD 10 pak 18.00

SPELL CHECKERS A.L.P. Systems

Mac Proof 3.0	110.00
Deneba	
Spelling Coach	.52.00
Microlytics, Inc.	
Word Finder	.32.00
Working Software	
Spellswell 2.0	.42.00

BUSINESS

Aatrix	
Payroll 3.5	89.00
Payroll Plus 3.021	39.00
TimeCard	
TimeMinder	99.00
Checkwriter	19.00
CE Software	
Quick Mail 1	80.00
Cricket Software	
Cricket Presents	89.00
Macropac	
101 Macros for Excel	40.00
Microsoft	
Excel 1.5	61.00
Works 2.0	89.00
Multiplan1	20.00
Shana Enterprises	
Fast Forms	85.00
Symantic	
More II	32.00
MacSQZ!	

Call Toll Free 1-800-541-4620

Customer Service (515) 497-5270



PC Tools Deluxe (Central Point Software) - Now the world's best-sell-ing utilities are available for the Mac. A collection so complete you'll find there's absolutely no reason to look beyond PC Tools Deluxe.

Hours

Monday through Friday 9-9

> Saturday 9-3 Central Standard Time

- VISA and MASTER-CARD accepted with no additional charge.
- · Your credit card will not be charged until we ship vour order.
- Iowa residents add 4% sales tax.
- A \$4.00 shipping charge will be added to all orders.

Prices subject to change without notice

Ad



3.5" BULK Each 1.11

Diskette Oklahoma 1-800-654-4058
Po. Box 1930 LAS VEIJAN, OK. 75005
PO. BOX 12306 LAS VEIJAN, N. 18712 TELEX-4933362 FAX 405-495-4598



Delaware 1-800-451-1849 Diskette Okla Oklahoma 1.800-654-4058 Nevada 1-800-621-6221 TELEX 4933362 FAX (405) 495-4598

10 Box

Delaware 1-800-451-1849

#0.80X 10247, WILLIAMOTON, DE. 19850

| Oklahoma 1-800-654-4058

#0.80X 1024, BETHANY, OK. 72008 TELEX 4933362 * * * * FAX(405) 495-4598

Minimum order \$2000 "No Surcharge on Visa Master Card." COD orders add \$300. Surface Shipping UPS add \$300 per 100 for 31/2" or 51/4, add \$400 per 100 for 8." U.S. Mail delivery add 9%." Prices subject to change without Notice."

Circle 562 on reader service card



Serving the Mac Market

New Software	
C•A•T2.0NCP	\$ 229
Certificate Maker2.0CP	24
Copy II for the Macintosh7.2NCP	20
DeskPaint 2.0NCP	69
DiskExpress1.5NCP	32
Falcon 22.01NCP	32
FileMaker II4.0NCP	239
Fontographer2.4.1NCP	239
4th Dimension1.0.6NCP	489
HyperCard1.2.1NCP	42
Jam Factory1.32CP	127
KidTalk1.0NCP	25
Lightspeed C3.01NCP	95
MacGolf Classic (Color)3.0CP	54
MacDraw II2.0NCP	329
MacMoney3.02NCP	62
Micro Planner Plus6.0NCP	445
MicroPhone II2.0NCP	225
MiniCad+1.0NCP	524
Microsoft Excel1.5NCP	257
PowerMath II2.5NCP	108
Practica Musica2.0NCP	79
Quicken1.01NCP	33
Read-It! TS1.06HNCP	79
Speller Bee1.0NCP	25
Spelling Coach Prof3.0ANCP	105
	200
Strictly Business GL1.98NCP Suitcase II1.0NCP	45
	82
SuperLaserSpool2.0NCP	129
SuperPaint II1.0NCP	59
Symantec Utilities1.02NCP	
Tempo II1.0NCP	199
ThunderScan4.0NCP Virex1.2NCP	
VIIEX1.ZIVOF	69

Levco SE Accel. w/ 688811 yr. \$ 503	1
	,
1 Megabyte SIMMsSOJ/ 100 ns1 yr. 348	
Cableslowest prices Call	ĺ
Disks-Sony SS/DDBox of 10 13	
Disks-Sony DS/DDBox of 10	
Emac 20 SE int HD40ms1 yr. 448	
Emac 20 Deluxe ext HD40ms1 yr. 548	
Emac 40 Impact+ HD19ms1 yr. 795	
Emac MD 2400 Modem1 yr. 218	
MacOpeneropens Mac caselifetime 17	
Ribbons-BlackImageWr. I/IIbox of 6 22	
Ribbons-BlackImageWr. LQeach 17	
Ribbons-MulticolorImageWr. IIeach	
Taxan 19" Monitor includes: anti-glare,	
tilt/swivel, & cardSE/Mac II1 yr. 1375	
XP30 ext HD1 MB/sec data trans1 yr. 672	
ThunderScan Mac II power acc90 days 42	
TurboNet STTN512K/+/SE/Mac II1 vr. 31	

Hardware / Other

All items subject to availability
Prices subject to change without notice
Defective hardware repaired or replaced at our discretion

Rental software is being blown out the door at blockbuster savings! All is guaranteed intact. 50% to 70% off. Call for price list!

- Toll-Free Order Line 24 hrs.
- Toll-Free Customer Service
- Tech Support (713) 529-1100
- \$3 Shipping (48 Hrs. if by 2:00 CST) Continental USA only
- · Visa & MasterCard no Surcharge
- No charge on split ship completions

2211 Norfolk * Suite 518 * Houston, Tx * 77098

20 Megabyte External

Hard Drives

naru Drives
AST 20 mg/20 mg Tape Back-up\$749
CMS
(Mac Plus, SE, II)
SD 20 Megabyte\$499
SD 30 Megabyte5599
SD 60 Megabyte\$799
SD 80 Megabyte \$1249
CMS Pro Series Internal Mac SE/II
30 Megabyte SE rear\$499
45 Megabyte SE rear\$649
65 Megabyte SE rear\$899
80 Megabyte SE rear \$1199
100 Megabyte SE rear \$1489
40 Megabyte Mac II\$549
60 Megabyte Mac II
80 Megabyte Mac II \$1145
150 Megabyte Mac II 1879
300 Megabyte Mac II \$2749
Cutting Edge
800K External Drive\$175
Wedge XL30\$625
Wedge XL45\$825
Everex/EMAC
External 20D
External 20 Zero Footprint\$549
Impact 40\$549
Impact 40 plus\$849
Impact 60\$989
Impact 80 \$1349
Internal Mac II 20 Megabyte \$445
Internal Mac II 91 Megabyte \$1395
the last control of the state o

Micro Net Technology

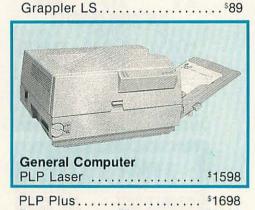
External 300 Megabyte \$2995

External 620 Megabyte \$3995

Epson Printers FX-850, FX-1050, LQ-500



Hewlett Packard						. 2				
Grappler LQ								٠	\$89	2
Epson LQ-500 24 pin, 180 cps.										
Grappler C/Mac		٠		٠	•				579)
9 pin, 180 cps										
Epson LX-800										



GCC Write Move

Portable ink-jet printer......\$529

E-Machines

- III	
Big Picture 17" Monochrome	\$1298
Big Picture T-16 Color	52698
Big Picture T-19 Color	s4498

Magnovox 14" Color5538

		-	_		
1000		129			
R/I	on	iŧ	0	rm	١

MOINE	1111	
Viking	1 19"	51498
	2400 24"	
Viking	GS 19"	\$2498
	10 Color 19"	

Sigma Design

Pageview Plus/SE 15"	. 5988
Silverview 21"	\$1528
Siverview 256 Gray Shades .	\$2398
Colormax 19"	\$3898



Magnovox 14" Mac Display 640 x 480 Resolution\$538 Fine Dot Pitch, Tilt & Swivel Base

Scanners

Reversion 13995	PLP Plus	Microtek 300C 16 gray levels \$1349 300QS 64 gray levels \$1949 300Q 256 gray levels \$2749 400G 256 graylevels 400 dpi \$3349 All Scanners bundled w/Software. Please call for competitive system pricing.
Comf		









279 South Beverly Drive, Suite 1200, Beverly Hills, California 90212

Hard Drive \$449



Modems Abaton InterFax\$389 Beverly Hills External 1200 Baud \$99 External 2400 Baud \$149 Internal 2400 Mac II\$199 **Epic Technology** Internal 2400 Mac II\$319 Everex Emac External 2400\$219

Accessories
Abaton Propoint\$98
CH Products Flightstick\$48 Mach IV Joystick\$48 Mirage\$38
Cutting Edge Mac 105 ADB Keyboard\$129
Datadesk Keyboard Mac 101 or ADB version \$129 Hyperdialer \$25
Dust Covers/Carrying Cases Mac/Plus/Se

Generic Computer Supply
Disks Box of 10 DS/DD\$17
Mouse Pads7
Monitor Stand\$18
Printer Stand 80 column\$14
Printer Stand 132 column \$19
Surge Protector 6 outlet\$18
Kennsington
Superbase\$33
System Saver
System Saver SE52
Security System\$34
Mac II System Stand\$19
Masterpiece Mac IIs105
Keyboard Cable ADB\$25
Monitor Extention Kit\$33
MacTilt & Swivel\$22
Turbo Mouse\$118
Turbo Mouse ADBs118
Microspeed
MacTrac Trackball\$78

Low prices, great service!

Practical Peripherals Mac Pack 2400\$239
U.S. Robotics External 2400\$169
DCA Mac Irma-Mac II or SE\$795
Dove Computer MacSnap Tool Kit
MaraThon 020 Accelerator \$549 Co-Processor 68881 \$249
Call for SIMM prices

GCC Technologies Hypercharger 020 Accelerator . \$679

Tape Back-up Systems CMS 60 Megabyte External TS-60.....^{\$729}

Micro Net Technology 150 Megabyte External \$1499

Software						
Aldus Pagemaker						.\$389
Microsoft Excel						
Microsoft Word						
Microsoft Works						

Imagewriter II Carrying Case	59
Mac Plus/SE Carrying Case	
Mac SE w/Ext. Keyboard	69

Ergotron Muzzle.....\$58

Farallon MacRecorder Sound System .. \$129

OUR POLICY

- Plain and simple. Hardware; your satisfaction guaranteed or your money back.
- · Software; defective software will be replaced immediately. Manufacturers policies prohibit us from offering refunds on opened software.
- · We accept most major credit cards with no surcharge added.
- · Your credit card is not charged until we
- · Please allow 10 days for personal and company checks to clear.
- C.O.D. orders accepted.
- We gladly accept purchase orders from most major institutions.
- International orders accepted.
- · California, Texas, Georgia and Arizona residents please add the appropriate local sales tax.
- · To Place orders call Monday thru Friday 7AM to 6PM P.S.T.
- Prices and availablility subject to change.



Mobius										
Fanny Mac QT				٠						\$58
SE Silencer	 •		•							\$39
Mouse System										
A+ Mouse									•	\$65
A+ ADB Mous										

SHIPPING

All items in stock will ship in 24 hours. We offer daily service from Federal Express, UPS, U.S. Postal Service. UPS ground shipments, please add 50¢ per pound. UPS Air Shipments, please add \$1 per pound. Minimum shipping charge \$4.00.

Circle 5 on reader service card

The proven resource for Macintosh systems & support.

1 MB SIMM's



1MB SIMM's Lowest Price Starting under \$200Call

MAGIC DRIVE INTERNAL

300 mb (For Mac II)\$	1995
150 mb (For Mac II)\$	1395
91 megabyte (For Mac II, SE)	\$995
80 megabyte (For Mac II, SE)	\$749
60 megabyte (For Mac II, SE)	\$599
46 megabyte (For Mac II, SE)	\$599
40 megabyte (For Mac II, SE)	\$559
30 megabyte (For Mac II, SE)	\$475
External drives available	

VIDEO BOARDS

Raster Ops

Color Board 104......\$3299
24-bit True Color, graphics board
Color Board 108.....\$1149
8-bit, high-res graphics board
19" Trinitron Monitor ...\$2999
Finest monitor available today!

Cornerstone FPD.......\$795
Full page display!

19" B/W for Mac II......\$1499

MAGIC NET



100% Flash Box, Local Talk, Phone Net compatible SALE19.95

3 MB LASER PRINTER



Qume ScripTEN \$3395 Qume CrystalPrint \$3295 Jasmine Direct Print \$3395 General Computer call ColorScript 100call

MAGIC MODEM 2400



100% Hayes Compatible 2400 Baud 2-Year Warranty......\$129

SOFTWARE

We carry over 2000 software products for your Mac, so please call and ask for items not listed in this advertisement.

Adobe Fonts	Save 33%
Aldus Freehand	299.00
Big Thesaurus	69.00
Canvas 2.0	169.00
FontSizer	79.00
Fox Base +	205.00
Fox Base Multiuser	call
Hyper DA	41.00
Illustrator '88	325.00
LightSPEED C	95.00
MacDraw II	299.00
MacInTax	69.00
Mac Link +	139.00
Mac Recorder	139.00
Managing Your Money	129.00
MiniCAD +	519.00
MS Works 2.0	199.00
PageMaker 3.0	395.00
Persuasion	355.00
Quark XPress 2.0	499.00
Quark Style	199.00
Quicken	35.00
QuickKeys	65.00
Suitcase II	48.00
Sum	59.00
SuperPaint 2.0	129.00
TOPS	119.00
Virex	68.00
WingZ	269.00
WriteNow 2.0	139.00

HARDWARE

External Drives

Magic 30meg	599.00
Magic 60meg	699.00
20meg SCSI	475.00
45meg Removable	999.00
Cartridges, each	100.00
600meg Read/Write	
Optical Drive	3995.00
Macintosh Plus	call
Mac SE, II	call
Mac SE/30, IIx	call
Apple Scanner	call
FAX Modem	call
Abaton Interfax	365.00
Grappler LQ	95.00
PerfectTek PC Cards for +, SE	499
2 Meg Upgrade (Mac II)	325.00
A+ Mouse	63.00
Lightning Scan	call
Kraft Quick SE, +	35.00
TOPS Flash Box	129.00
Universal PrinterStand	12.00
Cutting Edge	
105 Keyboard w/Quick Keys	115/145
800 K Drive	179.00
Tape Backup 60mb	699.00
Mac Recorder	139.00
MIDI Interface	87.50
Turbomouse 3.0	119.00
Seikosha Printer	234.00

Write Move Printer

ACCESSORIES

Disks:	DS	SS
Sony (10)	19.00	12.90
Sony Bulk (50)	1.44	1.21
MacDisk Bulk (50)	.99	.98
KAO Bulk (50)	1.35	1.35
KAO Boxed (10)	15.50	12.00
Black Ribbons		3.00
Colored Ribbons		3.50
ImageWriter LQ Ribb	ons	15.00
ImageWriter LQ 4-Co	olor	25.00
Mac Plus, SE Bag	59.00	/69.00
Teak Disk Box 50/100/	150 16	/25/33
Disk File/30/80	7.00/	12.00
MacBible Version II		18.00
MacGuard Surge		25.00

BOARDS/UPGRADES

THE RESIDENCE OF THE PARTY OF T	
030 Railgun	4995.00
Daystar 68030	5250.00
Orion II	call
Novy Mac 20mx 16 mhz	599.00
Novy Mac 20mx 25 mhz	1099.00
Orion 16 mhz	699.00
Epic 2400 Internal	289.00
68881, 68882 Co-Processo	ors call
Magic SCSI	69.00
Dove SCSI	99.00
512K-1024 Upgrade	249.00
128K-512K Upgrade	299.00
128K-1024K Upgrade	499.00
800K Drive & ROMS	299.00
Dove	call

ORDERING

Orders ONLY: 1-800-622-3475 Information: 1-512-343-9441 FAX: 1-512-343-6141 Tech: 1-512-343-6133

Hours: 7am - 10pm, M-F, 10am -6pm Sat-Sun CDT

Minimum Order: \$40.00 Payment:



American Express, Visa, Discover, Master-Card (No surcharge), Checks, C.O.D., and Company & Institution PO's. Net 10.

Tax: Texas residents only, add 8% sales tax.

Prices and items are subject to change and availability.

Terms: You are not charged until your order is shipped. Returns may be subject to a restocking fee.

Shipping: Minimum \$4.50 — Airborne, UPS Next Day & 2nd Day Air, US Mail.

FREE UPS Ground on pre-paid orders under 40 lbs.

MacProducts USA carries over 3500 products for the Mac, so call for products not listed. Call for a free catalog.

188



call

1-800-MAC-DISK

The Lowest Prices with Technical Support, Too!

WARNING: Beware of money-back offers on hardware! MacLand sells only NEW, NEVER USED merchandise. We will not send you re-packaged, slightly-used hard disks.

45 Megabyte

External Hard Drives

LAternar Hard Drives
20 Megabyte
Everex 20D\$499.
Everex 20DL
MacBottom 21\$649.
30 Megabyte
CMS Enhancements 30\$589.
MacBottom 32\$689.
MacLand
MicroNet 30\$579.
Wedge 30\$559.
40 Megabyte
Conner 40
Everex 40DL
Everex 40 Impact
MicroNet 45 \$699
MicroNet 45
Wedge 45\$714.
CO 70 Manahuta
CMS Enhancements 60\$749.
Everex 60 Impact
MacBottom 70
MacLand
MicroNet 62
80 Megabyte
CMS Enhancements 81
Everex 80 Impact
MicroNet 80\$949.
Quantum 80*\$899.
90-100 Megabyte
Conner 100
CDC 90\$1,049. MicroNet 90M\$949.
140 Megabyte
Rodime 140 \$1,299.
150 Megabyte
CDC 150
CDC 150
173 Megabyte
CDC 173
MicroNet 173 \$1,649.
Drives over 173 Meg Call for Price
Internal Hard Drives
for the SE
ioi tile 3L
30 Megabyte
CMS Enhancements 30\$469.
Cutting Edge 30
40.00

40 Megabyte

45 Megabyte	
CMS Enhancements 45	\$659
CMS Enhancements 45 MicroNet 45M Cutting Edge 45	\$500
Cutting Edge 45	0610
Cutting Eage 45	фотэ.
60 Megabyte	
Everex 60SE	6040
80 Megabyte	
CMS Enhancements 80 Everex 80SE	\$1.099
Civio Efficiente do	C1 070
Everex 80SE	\$1,079.
MicroNet 80	\$889.
Quantum 80*	\$879.
90-100 Megabyte Conner 100	
Conner 100	\$899.
MicroNet 90	\$849.
THE REAL PROPERTY AND A PROPERTY OF THE PERSON OF THE PERS	
Mac II Internal	To all the
Hard Drives	
nard Drives	
40 Magabyta	
40 Megabyte Conner 40	CE AD
Conner 40	ф549.
Everex 40ID	\$6/5
MicroNet 45M	\$599.
MicroNet 45M	\$599
60 Megabyte	
CMS Enhancements 60	\$659
Everex 60ID	\$799
Manland	\$500
MacLand	фооо
MacLand	\$629
On Magabuta	
CMS Enhancements 81 Everex 80ID MicroNet 80 Quantum 80*	#nnn
CMS Ennancements 81	фэээ
Everex 80ID	\$1099.
MicroNet 80	\$889.
Quantum 80*	\$879
Guantani oo	
90 Megabyte CDC 90	
CDC 90	\$949
MicroNet 90M	\$849
	and the same of
100 Megabyte	name of the last
CMS Enhancements 102	\$999.
Conner 100	\$899
140 Megabyte	S & A & S
CMS Enhancements 140	\$1,149
Rodime 144	\$1.199
Hodino 1447.117.117.117.117.117.117.117.117.117	
150 Megabyte	
CMS Enhancements 150	\$1,749
CDC 150	\$1 699
Misroblet 150	£1 600
MICROINEL 150	ф 1,099
173 Megabyte	
CDC 173 Megabyte MicroNet 173	\$1.549
MicroNet 173	\$1 540
MICIONEL 1/3	Ф1,049
300 Megabyte	
CDC 300	\$2,349
CDC 300	\$2.679
MicroNet 300	\$2 3/10
Disam 007	CO 005
Priam 327	\$2,295
Priam 327 CDC Wren Runner	\$2,595
	THE RESERVE

Removabl
MicroNet 45
Tape Back-
CMS Enhancements 60 Everex 60 Irwin 40 Irwin 80 MicroNet 60
Hardware Acce
Anchor-5 year warranty (includes Cable & Software) 2400 Baud Modem
Everex 2400 Baud Modem & Cable
Farrallon Mac Recorder Phone Net Connector
Cutting Edge ADB Keyboard
General Computer Business Laser Printer Personal Laser Printer
Irwin Accelerator 25 SE
Qume Crystal Print Publisher Script 10 Laser Printer
Radius 16+ Accelerator Radius 25 Accelerator Full Page Display +, SE Full Page Display II Two Page Display SE, II Radius Color Monitor
Memory
SIMMS IN STOCK If you didn't call us you paid your memory!
All hard disk drives carry a rone year warranty except fo drives, which have a manu year Warranty.
your warranty.

es

MicroNet 45	\$1,199
(includes one cartridge)	
45 Cartridge	\$119

Ups

CMS Enhan	CE	er	n	e	n	t	S	6	C)					\$699.
Everex 60.															
Irwin 40															\$899.
Irwin 80															
MicroNet 60															\$739.

ssories

Anchor-5 year warranty	
(includes Cable & Software) 2400 Baud Modem	.\$149.
Everex 2400 Baud Modem & Cable	.\$209.
Farrallon Mac Recorder	
Cutting Edge ADB Keyboard	.\$119.
General Computer Business Laser Printer	
Irwin	
Accelerator 25 SE	1,249.
Qume	000
Crystal Print Publisher	
Radius	
Radius 16 + Accelerator	.\$739.
Radius 25 Accelerator	\$1,249.
Full Page Display +, SE	
Full Page Display II	1,3/5.
Two Page Display SE, II	Call
nadius coloi Monto	Jan.

too much for

manufacturers or the *Quantum ufacturers two





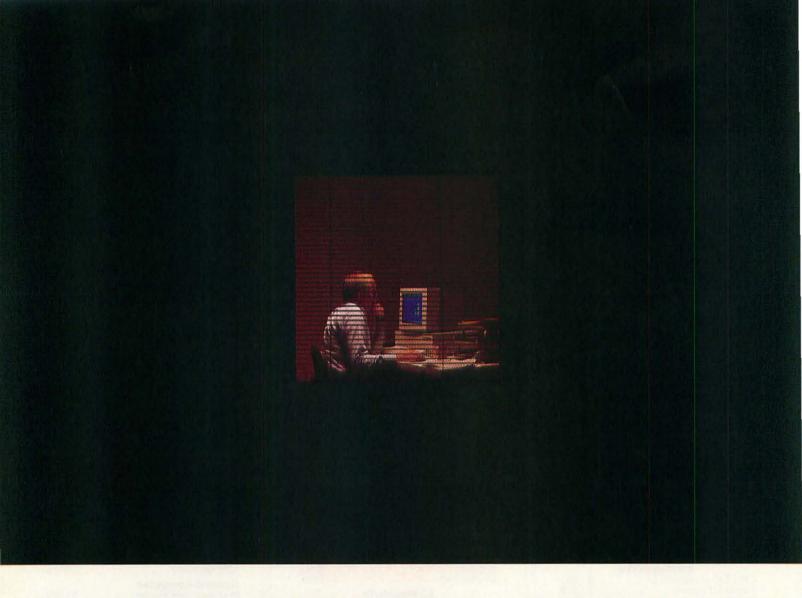




For Ordering and Technical Support Call 1-800-333-3353

Visa, MasterCard, and American Express accepted NO surcharge. Your Credit Card will not be charged until your order is shipped. We accept COD orders, additional \$5.00 charge. AZ residents add 6.5%. All shipments made by Federal Express

Standard Air which is 1 to 2 day service. COD's Shipped by UPS 2 day air. Call for shipping costs. Products purchased in error are subject to a 20% restocking fee. All prices subject to change without notice. All products subject to availability



There's nothing wrong with a film recorder that takes a few extra minutes per slide... Until you need a few dozen slides from your Mac.

You could spend another late night with your film recorder. Or you could reduce your quality and shoot nothing but 2,000-line slides.

Or, much better, you could get the new Lasergraphics Mac-LFR™. In just two minutes, the LFR produces boardroom quality, 4,000-line slides.

That's right. For less than \$10,000, the LFR delivers the quality **and** speed of film recorders costing much more and/or performing several times slower.

You'll get rich, vivid color. Outstanding image sharpness. And enough speed to make big jobs you thought would be a nightmare

go like a dream.

And since the LFR is virtually indestructible, you won't have to worry about it holding up during high-volume jobs.

The Mac-LFR is compatible

with all Pict I and II files, no matter which graphics package they come from. Even packages which do not output Pict files can drive the LFR directly over its SCSI interface.

And when you don't have a color monitor, the LFR will, under your control, transform black and white images into professional quality color slides.

The printer option is supported by the same powerful, fast software that makes the slides. The Mac-LFR will drive the printer to make color prints as slide preview or overhead transparencies for presentation.

The complete solution for color graphics output is as close as your telephone.

Time is money. So if your present or contemplated film recorder is wasting it, it's time to get the Lasergraphics Mac-LFR.

Take a minute to call (714) 660-9497. It could save you hours, or whole nights for that matter.



Mac is a trademark of Apple Computer, Inc.

Circle 322 on reader service card





≣Instant Link≣

Macworld Catalo

Now Macworld connects you with the world of Macintosh products instantly. And cost-effectively.

The Macworld Catalog is your immediate access to hundreds of Macintosh products, manufacturers, and services. Each month, this special direct response section brings you detailed product information arranged by category—so you can quickly compare prices and capabilities. Then pick up the phone and order!

For the best Macintosh buys, scroll through The Macworld Catalog.



Instant Link: Macintosh Products, Manufacturers, Services 🎹



■The Macworld Catalog

Furniture273 Hardware273 Mouse Pads273

Supplies273

Accessories

Hardware

274
275
275
275
276
276
278
278
278
278

Hypercard Stacks

278

Services

Computer Insurance 27	19
Data Conversion27	79
Desktop Output28	30
Desktop Publishing 28	30
Disk Duplication 28	30
Laser Recharge28	30
Training28	31

Software

Accounting	281
Architecture	.281
Artificial Intelligence	.281
Astrology	281
Bar Code	281
Business	281
Business Mgmt	282
Clip Art	282
Communications	282
Data Base	283
Desktop Publishing .	283
Document Mgmt	283
Educational	283
Engineering	284

285
285
286
286
286
286
286
287
287
287
287
288
s288
288
288
288

Religion	289
Rental	289
Retail	290
Sales/Marketing	290
Scientific	290
Statistics	290
Utilities	290
Word Processors	290

Miscellaneous

Business Oppor	290
Mailing Lists	290

Categories are subject to change

Advertising Rates & Information The Macworld Catalog

The Macworld Catalog section is a monthly link-up for advertisers and volume purchasers of Macintosh-related products and services. The Catalog offers advertisers a low-cost marketing opportunity and provides readers with a timely, easy-to-use menu for product buying.

Display ads are sold by column inches (2" minimum). Standard red is available as a second color. Text-only listings are available for a minimum of three issues at \$399 per issue \$1197

For more information, space closings, and material deadlines, please call toll-free 800/888-8622.

Instant Link: **Macintosh Products**, Manufacturers, Services

The Macworld Catalog 501 Second Street San Francisco, CA 94107 800/888-8622

Account Managers Niki Stranz, Western U.S. Carol Felde, Eastern U.S.

The Biggest



Take advantage of the direct link with your buyers that maximizes exposure at a low cost.

The Macworld Catalog reflects the expanding corporate Macintosh audience whose purchasing activities increasingly include mail order. The cost-effective direct response advertising available monthly in The Macworld Catalog links you instantly with nearly 500,000 qualified buyers.

Get into the link. Call 800.888.8622 and place your ad now!

800.888.8622



Instant Link: Macintosh Products, Manufacturers, Services 🏢



The Macworld Catalog

Accessories

Furniture

The MacDesk

The Perfect Workstation Harwell Services Long Beach, CA 90814

> Only \$30 Why spend \$100 or more ?

- Affordable, sturdy, functional, handsome
- Raises the Mac 4 inches

(213) 433-3807

- Handmade of 100% wood
- Finished in cherry, golden oak, or walnut
- 3 models to choose from
- Holds both external and hard disk drives
- Keyboard and other peripherals fit underneat
- Cost only \$30 plus shipping and handling

CIRCLE 672 ON READER SERVICE CARD

Hardware

KODAK DATASHOW

+Apollo, Chisholm and others. Prices start at \$1097

Solutions for SE, Plus, 512, & Mac IIs, Apple IIs, & all PCs M/C, VISA, AMEX & COD



(415) 892-4744

Computer-Based Presentation Systems Since 1984

CIRCLE 633 ON READER SERVICE CARD

Security Kits/Cust Cables

For Mac+, SE, II, Image II, LW, & Apple II, IBM, clones & terminals. Since 1984. Largest security line available. MacLock secures Mac, Keyboard, mouse & most peripherals with 8-ft red coated aircraft cable. MacGuard prevents unauthorized use or power up. Lock incl. No tools reg. Also custom data cable for any computer need. Competitive prices. Vol. discounts & dealer pricing avail. MacProducts, 20231 San Gabriel Valley Dr., Walnut, CA 91789, 714/595-4838

TURBO MOUSE*

Now you can own the Winner of the 1988 Turbo Mouse Race, for less than half the retail price!! Our Turbo Mouse* has been named Top Input Device for '87 & '88 by the readers of Macworld. The '88 Macworld standings for Hardware-Top Input Device: • TURBO MOUSE* Abaton Mouse Trackball-Propoint • Apple Expanded Keyboard • Mac-101 Enhanced Keyboard • Mouse Systems A+Mouse. Also Turbo Mouse ADB at low, low prices! Cambridge Automation, Inc., 3260 Industry Dr., Signal Hill, CA 90806, 213/597-1626, 800-345-8666. 800/826-9214 (in CA)

TIZIO LAMP SALE The Museum of Modern Art design classic

Mac users love it for its bright, halogen light, glare control and great looks next to the Mac.

Special Price 40-50% Off

1 800 962-6789 CT: 866-4321

AmEx

114 Washington St., South Norwalk, CT 06854

CRCLE 620 ON READER SERVICE CARD

Mouse Pads

Mouse Pads

Custom Printing Available Cloth: Blue, Gray, Burgundy, Red, Brown, Green, Black, Navy & Platinum

Size: 8x71/2 8x91/2 81/2x11 12 Pads 3.25 3.50 3.75 72 3.00 3.25 3.50

144 2.85 3.10 3.35 PLASTIC: Blue, Platinum,

Gray & Red

81/2 x 11 Size: 36-16.00 12 Pads-16.50 144-15.25 72-15.75 CALL AND ASK US ABOUT OUR

VIEW PAD AND PICTURE PAD. Precision Line Inc., 14100 23rd Ave N., Minneapolis, MN 55441 1-800/328-0077, 612/557-1917

Company Logo Specialist

Grey, Green & Red Pads Size: 9 1/4in x 8 in x 3/8 in

- •12 pads \$9.50 w/logo
- \$8.50 w/logo •36 pads \$6.90 w/logo •72 pads
- •44 pads \$4.70 w/logo
- •500 pads \$4.14 w/logo •1000 pads \$4.02 w/logo

ENTIRE pad imprintable. Guaranteed to last. Multi-color jobs OK. SAMPLES w/your company logo \$12.50. Computer Expressions, 3833

Chestnut Street, Philadelphia, PA 19104, 800/443-8278

Custom Printed Mouse Mats™

12 mats 25 mats 50 mats 100 mats

- Prices include shipping
 Grey or Red Mats 8" x 9 1/2"
 Individual samples 12.50 each
 Long-lasting imprints will not rub off
 Custom colors, multi-color printing available
 Delivery Approx. 1-2 weeks
 Rush service is also available

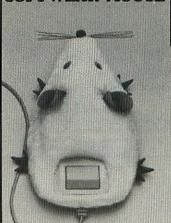
1-800-782-8628

Peak Products, Inc.

CIRCLE 671 ON READER SERVICE CARD

Supplies

SOFT:WEAR MOUSE



OUALITY DISKETTES

31/2" DS-DD 100% Certified Lifetime Warranty Major Mfg.

Color 31/2" DS DD (5 Colors) Orange-Red-

Yellow-Green-Gray DD80 Holds 80 31/2"

\$1195 Holder w/Lock 5.29 ea. 51/4" DS DD

s.69 ea. 51/4" DS HD 31/2" DS HD (2MB) Call for best price

Shipping \$4 per 100 diskettes Order by phone or send your check to:

AMERICAL GROUP (800) 288-8025

12132 Sherman Way, N. Hollywood, CA 91605

CIRCLE 686 ON READER SERVICE CARD

Dust Covers



Protect your equip-ment from dust, spills, and aggra-vating downtime with ABCOM DUST COVERS for personal computer

Attractive, water re-sistant packcloth in NAVY, SILVER, or BROWN

With the original rain bow ribbon accent. Extensive selection of dust covers for over 400 models, including: • IBM



. APPLE II SERIES

Custom-fitted, stylish and durable.

· MACINTOSH and numerous printers

MC & VISA ACCEPTED. PLEASE WRITE OR CALL FOR COMPLETE PRICE LIST AND BROCHLIPE 2333A N. SIERRA HWY, BISHOP, CA 93514 619/872-1946

CIRCLE 683 ON READER SERVICE CARD

LEATHER PAD

8" x 10" black top-grain leather, neoprene backed.

Great gifts, 5 year warranty.

Send only \$9. for either (includes S/H) to:

Foresight Designs, Box 70, Southeastern, PA 19399

(215) 647-8534 VISA/MC

CIRCLE 733 ON READER SERVICE CARD

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.



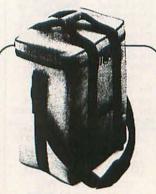
Instant Link: Macintosh Products, Manufacturers, Services 🏢



The Macworld Catalog



Supplies



Pack your Mac in seconds!

Cordura case has internal padded pockets for mouse, keyboard and drive. Available in six colors. Extended Keyboard version also available.

For a dealer near you call toll free

1-800-548-0053 West Ridge Designs 1236 N.W. Flanders Portland, OR 97203

CIRCLE 681 ON READER SERVICE CARD

LASEREDGE® Paper/Film

Get high resolution from plain paper laser printers and color plotters. LASEREDGE® high resolution Paper/Films are waxable for paste-up. The bright white background, denser image, and finer edge of line will allow enhanced capability for 300 dpi to reproduce on camera. Call or write for samples today. MC/VISA accepted. CG Graphic Art Supply, Inc., 481 Washington St., NY, NY 10013, 800/342-5858 FAX#212/941-9765

SECURITY

PADOLOCK TM PADOLOCK TM physically secures your computer from theft without cables or bolts. Two interlocking steel pads use high-bond acrylic adhesive technology to protect your acrylic adhesive technology to protect your equipment with 10,000 lbs. of strength. Easy to Install. Order keyed different or alike. \$ 79.95 + \$5.00 shipping CONTROL POWER TM gives you control over the use of your computer with a key. No unauthorized access. Control Power

attaches to any electronic device with a removable, 3 prong power cord. Order keyed different or alike. \$69.95+\$3.00 s/h

(415) 861-2223

DOSS INDUSTRIES

CIRCLE 669 ON READER SERVICE CARD

MacDisks for less.

3.5 DS/DD

Blue, Gray, Blk 5 Color Labels White Box Shrink Wrapped

50 or more. \$1.16 each. less than 50. (In 5 colors \$1.33, 50 or more)

3.5 DS/DD

50 or more.

Blue, Gray, Blk \$1.11 each. 5 Color Labels less than 50. Shrink Wrapped (In 5 colors \$1.28, 50 or more) .

Continuous form labels! 23/4" x 23/4" - 1 across - 2500 . . .\$12.00/M



Quality Disk & Label Specialist Since 1982 1040 Broadway, Westville, NJ 08093 1-800-426-3303

609-456-6996 • FAX #609-456-7172 All orders F.O.B. Westville, NJ. Fresno, CA. C.O.D. orders add \$2.20. Purchase orders, Visa & MasterCard accepted.

CIRCLE 692 ON READER SERVICE CARD



BANX™ Stackable 3 1/2" Disk Drawers

- Stacks vertically & horizontally
- Holds over 75 disks Security lock
- Four color-coded dividers included
- Retail \$24.95 MacWorld Special \$14.97

T. S. MICROTECH, INC. (213) 644-0859 12565 Crenshaw Blvd., Hawthorne CA 90250

CIRCLE 677 ON READER SERVICE CARD

MacHarness[™]

Carrier

Only \$29.95

Mac portability for less! Not bulky to carry & folds small for storage

Nylon webbing, padded leather shoulder strap, quick-release buckles Keyboard, mouse, &

cables attach with straps (included)

Gitbags Clairton, PA 15025 (800) 635-5482

(412) 653-1082

CIRCLE 703 ON READER SERVICE CARD

MACINTOSH **DUST COVERS**

Mac, keyboard & mouse. Reg. \$32NOW \$25

Mac II, monitor atop CPU, keyboard & mouse.

Reg. \$42 NOW \$33 *Free 8"x91/2" Mousepad valued at \$10 with cover set purchase.

Satisfaction Guaranteed. Computer Cover Company

23352 Peralta, #14, Laguna Hills, CA 92653 TOLL-FREE: 800/235-5330

VISA In CA: 800/237-5376 MC

CIRCLE 727 ON READER SERVICE CARD

ComputerWear

100% COTTON CANVAS

DUST COVERS!



MAC, II, ImageWriters, & Lasers

Beige w/ Grey Trim, Breathable, Static-Free! Available Individually or Special Set Price Call For Prices or Free Catalog. Dealers Welcomet

OrderToll-Free

-(800)826-

Contemporary ComputerWear San Francisco 94122 1320-36th Ave

CIRCLE 709 ON READER SERVICE CARD

Misfeeds • Smudges Wrinkled Letters

Laser-Fix

Laser Writer II \$39.95 + 3.00 Image & Laser I \$29.95 + 3.00

Visa or M/C . Call or Write

1-800-228-1383

J B Marketing Co. 10712 N Elma Dr. Spokane, Wa. 99218

CIRCLE 645 ON READER SERVICE CARD

Hardware

Bar Code

Multi-Function BAR CODE READERS

\$ 285 only (Decoder + Wand)

Keyboard emulation/ Programable with Macintosh, Mac Plus, Mac II, SE, IIGS IBM PC/XT/AT, PS/2, IBM terminals Compacq 286, 386; RS-232C Reads all standard codes

NO software or hardware modifications Ports for Pen and Laser Scanners

KASCO TECHNOLOGY, INC. 486 Casita way

Los Altos, CA 94023 (415)949-0969, FAX (415)949-3814 >> Reseller Discounts Available <<

CIRCLE 744 ON READER SERVICE CARD



📕 Instant Link: Macintosh Products, Manufacturers, Services 🔳



The Macworld Catalog



BAR CODE & MAGNETIC STRIPE READERS FOR MACINTOSH PLUS, SE & II

Connects on keyboard or ADB Requires no additional program or port Does not affect keyboard or mouse Industrial quality, heavy-duty units Also available

Magnetic encoder Code 39 Bar Code Printing Program Portable Bar Code Reader

> **TPS Electronics** 4047 Transport Street Palo Alto, CA 94303 415-856-6833 Telex: (Graphnet) 371 9097 FAX: 415-856-3843

CIRCLE 613 ON READER SERVICE CARD

NEW ID CARD SYSTEM FOR MACINTOSH SE & II **HOLDS 512 CHARACTERS**

- SmartCard encoder/reader connects on ADB.
- Records cards from any program that sends serial data
- SmartCards reusable up to 10,000
- Data input transparent to application.
- · Use for security, medical records, debit card, membership card.
- 1990s technology available now.
 Complete system \$525.00.

TPS Electronics

4047 Transport Street, Palo Alto, CA 94303 Telephone: 415-856-6833 FAX: 415-856-3843 Telex: (Graphnet) 371 9097 TPS PLA

CIRCLE 632 ON READER SERVICE CARD

Computer Systems

COMPUTER PACKAGES

SEs - Mac IIs - Laser Printers

CIRCLE 606 ON READER SERVICE CARD

AMERICA's

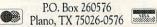
LOWEST

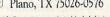
PRICED

NATION'S LOWEST PRICES Hi End Specialty Systems

- *SE 2 drive 800k CPU......2375.00 **SE 1 drive-20MB CPU ...2769.00
- **SE 1 drive-30MB CPU ... 2950.00
- **SE 1 drive-40MB CPU ...3275.00 ImageWriter II w/cable475.00
- RasterOps Color
- 19" 108 System.....3999.00 Hi Res Color Monitor......720.00
- Hi Res Mono Monitor322.00 CMS Hard DrivesCall
- SIMM Packs 1MBCall 30 day trial period/guaranteed 100% satisfaction
- 90 day warranty on Apple Apple, ImageWriter, CMS, RasterOps are all registered trademarks of listed manufacturers. Shipping charge 1.5%
- MC/VISA add 3% 15% restocking charge
- *All CPU's come w/standard keyboard. **All hard drives are internal.

Hi End Specialty Systems (214)620-9332





Hi Es.d Specialty Systems is not an authorized Apple dealer therefore all 90 day warranties should be sent to HESS for repair.

CIRCLE 721 ON READER SERVICE CARD

2253 Westwood Blvd, L.A. CA 90064

MacSE2Dr/20Mb* 2275./2595. MacSE30/45Mb* 2685./2895. MacII/40Mb* 3565./3995. MacII60/80Mb* 4145./4535. **CMS Hard Drives** MonitorMono/Color 325./725. *Keyboard Reg./Ext. 99./175.

DATA (213)470-9555 Computers Fax 470-9457

LaserWtr.SC/NT/NTX In Stock Mac+/20Mb 1345./1895. COD & Next Day Devilvery Available No Tax Outside California

CIRCLE 650 ON READER SERVICE CARD

New!! Accelerator Cards

Upgrade Your RAM to 4Mb

New Larger Hard Disks

■ MacWorks™ Plus

800k Drives

Your LisalMac X Complete Lisa/XL Systems/ Orders & Information Call: 800 • 323 • 1751 •
Or Call: 215 • 574 • 0357 / Fax #718 • 746 • 1071

Dafax • 14 North Drive • Malba, NY 11357

CIRCLE 616 ON READER SERVICE CARD

DISCOUNT MACINTOSH

Macintosh Plus	.\$1295
Macintosh SE 2 800k drive	.\$2295
Macintosh SE 30mb internal	.\$2695
Macintosh SE 40mb internal	.\$2895
Macintosh II 40mb internal	.\$3995
Macintosh II 60mb internal	.\$4150
Macintosh IIX 80mb internal	.\$6595
Apple keyboard for SE or II	\$100
Apple extended keyboard	\$185
Apple 13" color monitor	\$750
Mac II 8 bit video card	\$495
Imagewriter II w/cable	\$450
Imagewriter LQ w/cable	\$995
Apple laserwriter II N1	.\$3695
General Computer P.L.P. Plus	.\$1595
General Computer B.L.P	.\$2995

KIWI COMPUTERS P.O. BOX 67381 Los Angeles, CA 90067 213) 553-4643

CIRCLE 734 ON READER SERVICE CARD

Data Acquisition

MacPacq

The MacPacq transforms the Macintosh into a digital oscilloscope, chart recorder & waveform generator. A complete data acquisition & control system. 8 channel A/D, 8 digital I/O, programmable gain, 64K RAM. Optically isolated, line or nicad powered. Runs remote and/or connected to Mac. Comprehensive software interface provides for powerful & flexible system. \$1195 complete. Biopac Systems, 5960 Mandarin Dr., #D5, Goleta, CA 93117, 805/967-6615

Emulators

][ina Mac

An Apple //e computer ...all in software!

Run Apple II software on your Macintosh.

Convert Apple II files to Macintosh files.

\$149.95 Add \$3 for P&H COMPUTER: applications, Inc. 12813 Lindley Drive Raleigh, NC 27614 (919) 846-1411

CIRCLE 640 ON READER SERVICE CARD



Instant Link: Macintosh Products, Manufacturers, Services 🏢



Expansion Chassis

Expansion Chassis for the MACINTOSH

Open up your Macintosh Plus,SE or II with an expansion chassis system from Second Wave. Inc. ExpanSE Plus, ExpanSE, and Expanse II allow you to custom configure your Macintosh with a variety of option boards:

Accelerators • Monitors • MS-DOS Communications • Data Acquisition Industrial Control • Transputers SECOND WAVE, INC.

9430 Research Blvd., Bldg. II, #260 Austin, TX 78759 (512) 343-9661

CIRCLE 687 ON READER SERVICE CARD

■The Macworld Catalog■

A SIMM IS A TERRIBLE THING TO WA

Computer Care Inc. has introduced a new line of cost effective memory upgrades for Macintosh computers. SOFTSTEP allows you to upgrade by using standard 256K SIMMs.

SOFTSTEP I & II are socketed SIMMs with onboard memory that accept the factory installed 256K SIMMs to increase the machine's memory.

SOFTSTEP III, IV & V are SIMM modules that allow you to build 512K & 1 Meg SIMMs for the Macintosh using 256K SIMMs.

No machine modifications are required when using any of our products. 1 year warranty on all parts. Made in USÁ. Call for free information. VISA / MC accepted.

SIMMS

- 1 MEG SOJ
- 1 MEG DIPS
- 256K SIMMS



1-800-950-C

In MN (612) 920-CARE (2273) Dealer Inquiries welcome

ORDERS & INFO

CIRCLE 622 ON READER SERVICE CARD

Memory Upgrade

DON'T LET THIS HAPPEN TO YOU!

COLOR? MULTIFINDER? MEMORY S INGLE **UPGRADES** I N-LINE FOR THE MAC MEMORY PLUS, SE, II MODULES

CDC ENTERPRISE (714) 630-4633 2970-F E. LA PALMA, ANAHEIM, CA 92806

CIRCLE 736 ON READER SERVICE CARD

HARD DRIVES

your first choice for quality.

100% compatible with all internal ha

D SIMMS MODULE

FOR ALL MAC PRODUCTS

High Profile for the MacII

1MGx8 - 100ns

1MGx8 - 100ns \$ 360 Low Profile for the Macil, SE & Plus. \$ 360.

Quantity Discounts Available! 1 YEAR WARRANTY

WIL PRODUCTS INC.

8755 NW 57th St. Tamarac, F1 33351

(305) 726-5544

8 340.

CIRCLE 639 ON READER SERVICE CARD

HARD DRIVES LIFETIME WARRANTY

20 MEG INTERNAL \$349 31 MEG INTERNAL \$415 46 MEG INTERNAL \$489 20 MEG EXTERNAL \$55 31 MEG EXTERNAL \$510 41 MEG EXTERNAL \$565 46 MEG EXTERNAL \$659 80 MEG EXTERNAL \$864 100 MEG UP Call 100 MEG UP · Call

Fits in SE+Mac II with 2 drives Include PD+Backup Software External fits under Mac Seagate-Miniscribe-Quantum

WESTCOM COMPUTER P.O.Box 154-Ayden, NC 28513 800-422-8591-919-746-4961

CIRCLE 694 ON READER SERVICE CARD

MEMORY

1Mb High Profile 1Mb Low Profile

Top Quality

2 Year Warranty

Corp.- Govt.- Univ. PO's accepted

igaByle 703 Rio io Grande, # n, Texas USA 12/476-8000 12/476-0070 urope. 1/373959 41.4

CIRCLE 634 ON READER SERVICE CARD

ACCELERATORS MAC II -

Meg Increase \$ 499 5 349 4 Meg Increase \$1,095 \$1180. -SE or Plus

2 Meg Increase \$989 \$ 590.

Flatbed SCANNERs from \$1,595!

300dpl (non-gray) scale \$1595 • 300dpl 64 gray level \$2095 300dpl 256 gray level \$3095l Al Include SCSI Interfacel

Internal & External Hard Drives for Mac II/SE

Intern: 40mb \$589| • 80mb \$899| • 100mb \$ 1029| External: 20mb \$532 • 40mb \$699 • 80mb \$999 • 100mb \$1129| DOUBLE the speed of your SE-\$299.!

AOX Accelerator • Easy Installation • 16Mhz microprocessor 100% compatible • with all software and external hardware Second Source (602) 966-0357

2011 E. 5th Street, Suite 6 • Tempe, AZ 85281

Macintosh System Enhancements/New Macintosh Systems **New Mac Systems**

RAM/ROM Upgrades

128K to 512K 128K to 512Ke 128K to MacPlus 128K to 2MB Plus 512K to MacPlus 512Ke to MacPlus SCSI Interface

Used Mac Systems

512K \$ 679 512Ke \$ 889 MacPlus \$1149 Mac SE \$1900

Same Day Turn-Around on Macintosh Upgrades and Computer Repairs!!!



Macintosh • Computers in stock for immediate delivery!!!

Mac SE w/kybd Macil w/kybd ImageWriter II LaserWriter NTX Hardware/Acc. CMS 20-300MB 800K Drive 12-2400 Modern

12-2400 Modem Seikosha Printer Repairs/Parts Keyboards Repl. Mouse Logic Boards Power Supplies

Philadelphia, Pa. 19143 (215)471-9242-Ext. 30

5 immons Consulting

5526 Pemberton Street



The Macworld Catalog





Guaranteed Same Day Shipment

University and Corporate Purchase Orders Accepted Ask about our Exclusive Extended Warranty

Call Our Memory Hotline For Prices and Discounts

1-800-678-DRAM (678-3726)

COMDEN'Spring '89
April 10-13, 1999
McCormick Place
Chicago, Illnois

1117 S. Rock Rd., Suite 4 . Wichita, KS 67207 Phone (316) 685-4904 • FAX (316) 685-9368

In Canada Contact: Tallgrass Technologies, Canada, Inc. • 1775 Meyerside Drive #1
• Mississauga, Ontario L5T 1E2 • (416) 673-3244 • FAX (416) 673-3926

DartCard" ADDitiON" attention!2"

Solid State Hard Disk

Concentration"

Extended Memory Compaq Memory

Expanded Memory

CIRCLE 631 ON READER SERVICE CARD

MEMORY

UPGRADE

- 1 Meg SIMMs low profile
- . "No worry" lifetime warranty
- 30 day money back augrantee
- Corporate POs accepted
- Macintosh Plus/SE/II
- 256k trade-in
- Credit cards
- Call for pricing

2111 Dickson Dr. #30 Austin TX 78704

(512) 448-4133

Guaranteed same day shipping

CIRCLE 656 ON READER SERVICE CARD

About the Macintosh Finder

Finder: 6.1 System: 6.0 Total Memoru: 4.096k

Larry, John, Steve, and Bruce © Apple Computer, Inc. 1983-88

JAPANESE MANUFACTURE LIFETIME GUARANTEE

 1Mb SIMMS • 120ns or faster · Low Profile · In stock! We ship the same day of your order.

Frustrated with your old 512 KE? Don't get mad . . . UPGRADE!

Accelerator card transforms your 512KE

- · 2X speed of SE · 16mHz
- 1, 2.5, 4 Mb of RAM SCSI port
- Internal fan 100% software compatability
 - Also upgrades Plus & SE



PINNACLE NTERNATIONAL

2005 Hamilton Avenue • Suite 220 San Jose, CA 95125

> (800) 622-1722 (408) 559-8544

VISA/Master Card Accepted University P.O.'s

Macintosh Plus, SE and II are registered trademarks of Apple Computer, Inc.

CIRCLE 617 ON READER SERVICE CARD



Instant Link: Macintosh Products, Manufacturers, Services 🔳



■The Macworld Catalog

MAC SIMMs

Add memory to your Mac Plus, SE or Mac II. One megabyte SIMM modules available in 2 MB sets. We offer the lowest price you'll find anywhere, any quantity. Call for quote. MC/ VISA. Immediate delivery. Product satisfaction guaranteed. We've been in the RAM business since 1982. Palo Alto RAM, P.O. Box 50690.

Palo Alto, CA 94303, 415/858-0125

Upgrade w/Accu-Simms

Upgrade your Mac Plus, SE or Mac II with our surface mounted one MEG SIMM modules. We assemble, test, and have strict quality control, and can give a lifetime warranty. \$275.00 per meg. (Qty. discounts.) Full instructions come with order. (All SIMMS are 120NS or faster.) Prices may be lower by the time this ad comes out. Call for quote & info 1-800/662- SIMM. Data Memory Systems Co., 15 Union St., Lawrence, MA 01840 Tel: 508/683-2325 Fax: 508/975-5232

Miscellaneous



Giga Cell Systems - Nu-DATA

20 MB DATA CELL 20 \$489

Data Cell 60

Toll 800-634-1497

or call 216-543-1952 Visa Valley Computers 16744 W. Park Circle, Chagrin Falls, OH 44022 We DO NOT charge credit cards until order ships

CIRCLE 619 ON READER SERVICE CARD

278

APPLE CABLES & ACCESSORIES

... an economical source

Are you looking for a easy & low cost way to network all your Apple computers & peripherals? . . .

Try our

NETWORK ADAPTERS



and Apple IIe.

We also offer a selection of Apple SCSI cables and a terminator. Dealer and Distributor inquiries are al-

Give us a CALL!

(408) 294-6800

......

We offer printer & modem cables for the following computers: Mac +, Mac SE, Mac II, Mac, Apple IIc,

HYMCO

270 Cimino Street . San Jose, CA 95125

CIRCLE 746 ON READER SERVICE CARD

We BUY Mac's & Mac Stuff!!

We Buy, Sell, & Horsetrade Popular Computers!!

Mac Parts Call

Everex 20 meg. Used Mac's-----CALL

Shreve Systems

2421 Malcolm Street Shreveport,La. 71108

visa/m.c. O.K. 318-635-1121 Fax 318-865-2006

CIRCLE 609 ON READER SERVICE CARD

Networking

PhoneNET® System

The PhoneNET System is a network solution incl. hardware & software to build networks. manage & use them to their full potential. Components incl. PhoneNET Connectors, PhoneNET Repeater, Phone-NET StarController™w/Star-Command[™] network mgmt. software, TrafficWatch™ network analysis software, PhoneNET[™], CheckNET[™], Timbuktu[™] & Timbuktu/Remote[™] to operate other computers on local AppleTalk network or remote sites, & ScreenRecorder™ to record screen sessions for later viewing. Farallon Computing, 2150 Kit-

tredge St., Berkeley, CA 94704, 415/849-2331

Peripherals

9-Track Tape Subsystem For the Macintosh"



Exchange data files between your Macintosh and any mainframe or mini-computer using IBM compatible 1600 or 6250 BPI 9-track tape.

Unit can also be used for disk backup. Transfer rate is up to 1 megabyte per minute via your SCSI interface. Subsystem includes, tape drive, software, and complete documentation. For more information, call us today!

UALSTAR

9621 Irondale Avenue Chatsworth, CA 91311 Telephone: (818) 882-5822 Macintosh is a trademark of Apple Computer, Inc.

Printer

Apple Daisywheel Printer

TRUE letter quality on all Mac's & Apple II's. Proport, spacing, boldface, 198 columns. Fast 40cps speed and full 130 character printwheel. NEW \$449, RECONDITIONED \$349 includes easy MAC point & click driver software & cable. New bi-di tractor \$99, sheetfeeder \$49. All heavy duty with 90-day guarantee.

Quality Discount Computers, Inc., 135 Artist View Dr., Wellington, NV 89444, 702/465-2473, 415/487-8148

Hypercard Stacks

HyperBook™ Maker • \$59.95

 Prints your HyperCard stack as a collated, ready-to-staple book.



Your book can show the cards full size. half size. or 1/4 size.

· Another print option: both sides, 8-1/2" X 11" notebook format.

· Create new stacks automatically from cards in any other stacks.

· Review: Oct. 88 Macworld, p. 192 Ideaform Inc. (515) 472-7256 P.O. Box 1540, Fairfield, IA 52556

CIRCLE 705 ON READER SERVICE CARD

2 Great Business Stacks

Copyrights, Trademark & Patents

A comprehensive government information stack with "fill-outon-screen" forms. Complete How-To guidelines. Suggested Retail \$49.95.

Business LetterBase

An expandable letterbase stack of 200 plus business letters in 12 categories. Includes letter writing guide & much more! Suggested Retail \$99.95. Aardvark Software, 14400 Ella Blvd. #150, Houston, TX 77014, 713/872-8085

CIRCLE 733 ON READER SERVICE CARD

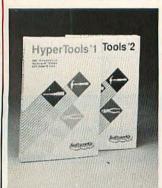


Instant Link: Macintosh Products, Manufacturers, Services 🕮



■The Macworld Catalog

ADD POWER TO YOUR STACKS



HyperTools™ #1: Icon Editor, Alignment & Array Creation Tools, Scan Cards, Script & Font Tools, XCMD tools, Button Tools and more. 16 Tools in all for stack design! \$99.95

HyperTools™ #2: Multiple Choice Lists for Fields, Field Sorting, Formatting & Data Validation, Sound Tools, Group Tools, Font Tools and more. 16 tools for visual presentation of datal \$99.95

Stack CleanerTM: Complete menu creation & editing facility for stacks. A script cleaner to reduce the size of scripts by using standard abbreviations. Plus utilities to merge, split, and clone stacks. \$49.95

Softworks Inc PO Box 2285 Huntington, CT 06484 (203)926-1116

CIRCLE 612 ON READER SERVICE CARD

Hyperworks

Need to make global changes in scripts? Need to make global changes in scripts?
Draw or move groups of objects? Make help cards? Let Tools from Hyperworks make your work easier. Work on single scripts or groups. Put any script or text onto the Tools Workdesk and use the editing Tools to make global changes, count, sort, number, find, add soft returns, offset groups of numbers, and more! Introductory price \$59.95

Call 1-800-544-0339 for orders only.



PO Box 5201, Mission Hills, CA 91345 818/891-0066

CRCLE 737 ON READER SERVICE CARD

HC ORGANISER

Personal Information Management Stack Rolodex + To-Do Lists + ♦Mail Merge ♦ Action Items♦

Stands alone or interfaces with Focal Point & downloads to the Z88 laptop, PSION Organiser, and the WristMac.



Free (\$50 value) with purchase of Focal Point II, WristMac, PSION Organiser II, or Z88 from MAXSolutions. Call for prices.

MAXSOLUTIONS 241 12th St. Del Mar, CA 92014 (619) 481-0479

CIRCLE 643 ON READER SERVICE CARD

Uncle Max has excellent stax for taxing times.

Extract your refund with Tax Stack™ and MH Accountante.

Excape the pressure with What's

His/Her Face ... ? and Angus MacFlvo.

> Write now for your free Rax of Stax™ catalog.



P.O. Box 2719, Dept. 4 Oakland, CA 94602

CIRCLE 745 ON READER SERVICE CARD

CLIENT means Business!

Client™ a user customizable client & sales management system, maintains customers, business & financial information, contract history & more. Specs Features: Pop-up choice lists for fields, redefine field names & formats, search by any combination of fields, mail labels, Includes latest Hyper-Card®. \$195.

Softworks, Inc., P.O. Box 2285, Huntington, CT 06484,

203/926-1116

MacRecorder™ Sound Svs.

When graphic & text are not enough, give presentations a dramatic dimension: narration & sound, MacRecorder Sound System is an audio workshop. Record, edit, play back live or pre-recorded sound. Includes: Digitizer & SoundEdit™ allows you to add voice, music & sound effects to HyperCard, Video Works[™], StudioSession[™], JamSession[™], & more; & Hypersound™ lets you record & work w/sound within HyperCard. Combine MacRecorder w/our ScreenRecorder[™] (avail. separately) to create multi-media presentations.

Farallon Computing. 2150 Kittredge St., Berkeley. CA 94704, 415/849-2331

HyperCONTROL™

Report Generator ...

- print selected cards
- · manipulate data field layouts
- · print faster than H-Card reports
- · save data in text files

Perfect for mailing labels. Just \$59.95, P&H included.



800-228-0417 NORDIC SOFTWARE 3939 North 48th Lincoln NF 68504 402-466-6502

CIRCLE 659 ON READER SERVICE CARD

Services

Computer Insurance



SAFEMARE

INSURES YOUR COMPUTERS

Full replacement of hardware, media. purchased software. As low as \$39 yearly. Covers fire, theft, power surges, other accidents. Blanket coverage: no list of equipment needed. Call for information or immediate coverage

1-800-848-3469 Local (614) 262-0559

SAFEWARE. The Insurance Agency Inc. 2929 N. High Street, P.O. Box 02211 Columbus, OH 43202

CIRCLE 635 ON READER SERVICE CARD



1-800-822-0901 CIRCLE 624 ON READER SERVICE CARD

Data Conversion

TAPE/DISK CONVERSIONS 🝜



Conversion services to or from over 2000 computer systems:

- · Magtapes · Mini Computers Micro Computers
 Typesetters
- Word Processors

CALL THE INDUSTRY LEADERS

PIVAR COMPUTING SERVICES, inc.

(312) 459-6010

165 Arlington Heights Rd #M Buffalo Grove, IL 60089

CIRCLE 641 ON READER SERVICE CARD

WE CAN CONVERT DATAFILES TO/FROM OVER 1,500+ SYSTEMS IN VIRTUALLY ANY FORMAT! — ON DISKS OR TAPES!

Dedicated Word

· Typesetters, etc.

Processors

· FileMaker*

Systems like: • Mainframes

- Minis
- Microcomputers
- Formats like:
- MacWrite*
 Microsoft Word*/Works*
- WordPerfect*
- Omnis*4th Dimension*
- Jazz*
 Excel*
 Tab-delimited ASCII, etc.

CompuData Translators, Inc. 3325 Wilshire Blvd. Ste. 1202

Los Angeles, CA 90010

800/825-8251 • 213/387-4477

CIRCLE 605 ON READER SERVICE CARD



Instant Link: Macintosh Products, Manufacturers, Services 🔳



The Macworld Catalog

Desktop Output

Authorized Linotype Imaging Center available by 24 hr. BBS. Film acetate as low as \$7.50/pg and RC paper as low as \$5.00/pg. Choose from more than 300 PostScript fonts for Mac and IBM-also available for purchase. High Resolution 2540 dpi, OCR, image scanning and disk conversions output to L300. 24-hour turnaround in most cases. Your disk or by modem.

Your ship has come in. 103 E. FRONT ST., RED BANK, NJ 07701 Call Toll Free 1-800-USS-TYPE

Desktop Publishing

LINOTRONIC 300 OUTPUT

If your current service bureau doesn't measure up, give us a call!

- Linotronic 300 PostScript Output (up to 2,540 dpl)
- · Macintosh & IBM
- · Adobe Font Library
- · BBS/Fax
- Scanning
- · Professional Staff
- Disk Conversion

Monotype Composition Company 2050 Rockrose Avenue Baltimore, MD 21211

Voice 301-467-3300 • Fax 301-467-0045 BBS 301-467-0156

CIRCLE 712 ON READER SERVICE CARD

Type/Imagesetting

Island Color Productions has so many advantages:

- High-resolution typesetting
- · Linotronic imagesetting
- · Laser printing
- · Computer graphics & design
- Speedy turnaround time
- From MAC, IBM or any ASCII
- ·Whether keyboard, disk, or modem

Why not take advantage of us? Island Color Productions, 11 Stony Brook Ave., Stony Brook, NY 11790, 516/751-0485 (voice), 516/751-0430 (24-hr. modem on line)

From your disk, to our Linotronic 300's, to the printing press fast!

3 Linotronic 300's to Serve You 24 Hour Turn Around 1,400 Type Fonts PC, Macintosh or Postscript Files

LAZER GRAPHIX

3250 S. Pollux-Las Vegas, NV 89102 1-800-873-8736

CIRCLE 647 ON READER SERVICE CARD

Laser Printing Services

LaserWriter (300-dpi)/Linotype L100 (1270-dpi) output of your Mac/IBM files. Disk or modem. 24 hr. service. Linotype \$7 per page (\$3.50 volume discount). LaserWriter \$.50 per pg. Desktop publishing specialists in consulting & design services. Hardware/software sales. Offset printing & bindery services available. Rent IBM/Mac \$5 hr. Adobe font dealer. Check our low price.

Laser Printing Services, 26058W. 12-MileRd., Southfield, MI 48034. 313/356-1004 (MI), 800/722-3475 (Nat'l.), Modem: 313/356-3186

Waldman graphics

Printers +

NYC / NJ / Phila DESIGNERS

We help top-notch designers achieve high resolution type & graphics using desktop tools. Keep your standards while lowering

tools. Neep your statitudits white loveling your costs. Original electronic art and PostScript special effects our specialty.

• 1270 & 2540 dpi pages from Linotype L300s

• Repro, Pos. & Neg. film • Disk or modem • Color separations • Scitex system • Awardwinning prepress, printing, binding & mailing

• 18 messengers! • Adobe dealer

We are the most knowledgeable people you will talk to. Call Mary Ann Ostberg for more information about our superb services. 212 925-2420 / 201 522-8778 / 215 627-7200 /

CIRCLE 637 ON READER SERVICE CARD

P.C. Copier & Laser Printer Owners



TONER Service Company

UPS to: 2128 Dolman St. Louis, MO

We buy empties - \$10.00

314-776-1155 800-88-TONER

CIRCLE 604 ON READER SERVICE CARD

Laser Recharge

Disk Duplication

SOFTWARE **DUPLICATION**

- All Formats
- Copy Protection
- Custom Packaging
- 48 Hour Turn Around
- Labels/Sleeves
- 100% Guaranteed
- Highly Competitive Pricing

1-800-331-4055 In WA (206) 633-0524



CIRCLE 682 ON READER SERVICE CARD

Remanufacturing Services

- Laser cartridges in Black
- Laser cartridges in Colors
- PC cartridges in Black
- Microfiche cartridges
- Remanufactured cartridge
 - Get back your cartridge!
 - Every cartridge pretested! Color test prints available!
- We support over 200 printers! Bulk toner • Quantity Discounts • Jumbo's
- We buy empties in quantities, please call.



\$64.50 \$39.50

100% Satisfaction

Prepaid Return

for laser cartridges

24 Hour Turnaround

800-777-8444

CIRCLE 696 ON READER SERVICE CARD



cartridges!

From \$4.495 We buy empties

call for brochure 800-426-8196





Instant Link: Macintosh Products, Manufacturers, Services 🏢



The Macworld Catalog



National Laser Recharge

Save your money! Let us recharge your toner cartridges for HP Series & II, Apple, Canon, QMS & others. All Canon, PC models 100% Guarranteed Factory-Like recharge method. No drill & fill! Long Life method for only \$49 incl. s/h. Up to 7 charges per cartridge Color avail. We buy empties -\$10. Send cartridge w/check or Money Order To:

National Laser Recharge 1413 W. Loop 281, Ste. 101 Longview, TX 75604 214/297-0200

CIRCLE 726 ON READER SERVICE CARD

Training

CBT Development Stacks



Create Computer-Based Training in HYPERCARD

Four disks, 32 stacks, almost 3 megs of routines, templates and scriptsa roadmap for developing CBT in HyperCard. 100-page User Manual with documentation, instructions and authoring ideas. Price: \$135.
No licensing fees First Reference First Reference, Inc. or royalties. VISA 516 Fifth Ave. #706 New York, NY 10036

or MasterCard.

: Version 1.1 (212) 730-8211

CIRCLE 644 ON READER SERVICE CARD

Software

Accounting

Time Saver Payroll™ V.5

- NEW FEATURES FOR 1989
- Full Featured Payroll system
- ·Salaried, hourly, comm. & tip wages •11 deductions, incl. fed., state & local taxes • 401k deductions • Tax tables easily edited by user . Monthly & quarterly reports, incl. 941, FUTA/940, SUTA Prints checks and W-2 forms . Flexible-easy to use! Requires Microsoft Excel \$99.50+\$3 s/h. MC/VISA/Chk. Demo \$15+\$3 s/h (applied to purchase).

Western Software Associates, 110 El Dorado Rd., Walnut Creek, CA 94595, 415/932-3999

Architecture

Desktop Architect

Professional detailing system by architects. Pre-drawn components to assemble custom details with minor editing. Parts kits combine bitmapped and object-oriented graphics. Includes wall and cross sections. details and interior elevations. 8"x10" format for working drawings. \$189.00 Super Paint required.

Desktop Architect Co. 634 N. High St., Columbus, OH 43215, 614/469-9906

Bar Code

BAR CODE FONTS FOR THE MAC

- Code 39 and UPC symbologies.
- · PostScript fonts for the LaserWriter. · Bit-mapped fonts for screen and ImageWriter.
- Use PrintBar MacTM with any software.
- · CodeScanTM bar code reader works as second keyboard.

(916) 622-4640 / FAX 916 622 4775

Bear Rock

6069 Enterprise Dr., Placerville CA 95667

CROIF 484 ON READER SERVICE CARD

50 Resumé Designs

MacResumé™

Professional Resumé Templates

Produce perfect Resumés with these preformatted designs in Microsoff, WORKS OR WORD please specify

MacResumé™ P.O. Box 713 Cambridge, MA 02140

2 Disk Set with CATALOG

1-800-422-9010 ext. 4091

CIRCLE 666 ON READER SERVICE CARD

Business

Artificial Intelligence

Instant-Expert™ 2.0

...a complete expert system development program for the price of a book." Macworld, April '88. Now you can make your computer intelligent. Instant-Expert is a powerful expert system development tool for your Macintosh. Applications developed with Instant-Expert effortlessly use your experience to solve problems, make decisions and provide intelligent solutions. \$69.95.

Human Intellect Systems, 1670 S. Amphlett Blvd., San Mateo, CA 94402, 415/571-5939

Term to 30 Day Guarantee **Demo Disk** Available

Sofffiair, Inc. 8753 Parkview Milwaukee, WI 53226

LOAN AMORTIZATION

Variable Rates & Flexible Payments BiWeekly, Monthly, & Annual Loans What If Analysis & Balloons Negative Amortization Customized Professional Reports

AmPack Plus \$89.95

365 or 360 Day Interest Skipped & Principal Only Payments Constant Principal Reduction Interest Only & Odd Day Interest Quarterly, SemiMonthly/Annual & Weekly And many more features

(414) 797-4490 Add \$5 S/H

CIRCLE 618 ON READER SERVICE CARD

Strategic Business & Marketing Plans

BizPlamBuilder Quickly and easily complete an effective business / marketing plan for presentation to senior management, investors or clients. A comprehensive and proven framework -Over 85 pages of outlines, headlines, structured sentences & paragraphs, lists, suggestions... already typed & formatted in 29 MacWrite™ & MS WORD™ files.

Marketing & Sales Oriented

MC/VISA

Everything you will need to organize, describe, promote & support your venture. (Similar to reverse engineering where the best elements of good plans are cut & pasted together.) No blank pages. Follow

Includes spreadsheet financials in Excel™.

the tutorials & edit into a finished plan. Includes manual. Preferred by investment capital experts, corporate managers & experienced consultants.

Also available:

- · Investment Capital Sources
- Domestic & International Marketing
 Employee Handbook Template

Tools For Sales™ Roadmaps to Better Mousetraps 13335 Wildcrest Drive • Los Altos Hills, CA 800/ 442-7373 • 415/ 941-9191

\$9900 + \$3 Shipping & 7% Tax (CA) 30-day acceptance / return. Site licenses available.

Visa MC Amex

CIRCLE 636 ON READER SERVICE CARD



Instant Link: Macintosh Products, Manufacturers, Services 🕮



The Macworld Catalog

50 TEMPLATES - \$ 79.95

FOR MICROSOFT EXCEL™ and WORKS™

PRE-BUILT • READY TO USE • IUST ADD VALUES

- Monthly payments
- Loan Amortizations
- Depreciations
- Full Cash flows
- Break-Even analysis
- Present Values
- Future Values
- Rates of Return
- Financial Ratios
- •and much more!

REAL ESTATE . ACCOUNTING . FINANCIAL PLANNING

1.800.284.8367 FINANCIAL CALCULATORS

318 MENDOCINO AVENUE, SUITE 22, SANTA ROSA, CALIFORNIA 95404

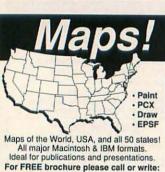
CIRCLE 735 ON READER SERVICE CARD

Business Mgmt.



CIRCLE 621 ON READER SERVICE CARD

Clip Art



800-334-4291



We've got the look you need!
From fun & sassy, to cool & classy.
*Cartoons 'Hands 'Special Occasions 'Education
Borders & Designa's And lots more!

Originals by top commercial artists. Many formats.
\$54.95/disk, plus \$5 Shpg. TX Res. add 8% tax.
ORDER NOW!

(512)388-7099
P.O. BOX 2142, ROUND ROCK, TX 78680
COPPYRIGH 1988, EVON ROCK, TX 78680
COPPYRIGH 1988, EVON ROMETTE 78680

©COPYRIGHT 1988, EYCON COMPUTER GRAPHICS

CIRCLE 716 ON READER SERVICE CARD





Newmarket, NH 03857 Call Toll Free 800-533-5504 Visa, MC, AX

CIRCLE 607 ON READER SERVICE CARD

Professional Quality

Color **PostScript**

Totem Graphics

5109-A Capitol Blvd. Tumwater, WA 98501-4415 (206)352-1851

CIRCLE 713 ON READER SERVICE CARD

Mac II Pioneers Alert!!!

Send US your VHS, your Beta. your 8mm, your huddled Stills,

COLOR/B&W. 8/24 Bit. Pict/ TIFF, DIGITIZED from ANY IMAGE!! Custom Grophics for Deskrop Publishing, Interior Design, Scho Landscaping, PHOTO REALISTIC ART, or Just plain New-Fashioned Funtil

For complete Details CALL THE SORCEROR'S APPRENTICE IMAGE/FREEZE BEFORE BUYING 1716 Madison Rd Cin., Ohio 45206

CIRCLE 698 ON READER SERVICE CARD

Communications

PacerLink (was pcLINK)

Connects Macs to VAX (VMS/ ULTRIX), DG Stratus & UNIX systems. Supports connections via RS232, direct Ethernet, & LocalTalk bridged to Ethernet. Provides terminal emulation (VT220, VT100), file transfer, virtual disk, & print services. PacerShare extension lets VAX system be an AppleShare compatible file server; PacerTOPS extension lets VAX/VMS system be file server on TOPS newwork. Pacer Software, Inc., 7911 Herschel Ave. #402, La Jolla. CA 92037, 619/454-0565

ADD THAT DAZZLING TOUCH...with PostScript MASTERWORKS™ ART NOUVEAU IMAGES



Volume 1 • EPS Format \$79.95 + \$3 S&H (U.S.) Check/Visa/MC • Contact: SILICON DESIGNS O. Box 2234, Orinda, CA 94563 (415) 254–1460

CIRCLE 721 ON READER SERVICE CARD





■The Macworld Catalog

Burroughs emulation

Contact™ emulates TD/MT/ET and T27 terminals. Sophisticated data capture - all screen data can be used by spreadsheet, database or word processor... CANDE file transfer, fully à la Mac interface, soft keys, multiple pages & addresses, password protection... Soon: advanced file transfer

Avenue Software Inc. 1173 W. Charest Blvd. #390, Québec, Qc Canada, G1N 2C9 - Tel. (418) 682-3088 CIRCLE 642 ON READER SERVICE CARD

Data Base

Bookends Mac

Bookends[™] is a specialized database for managing your references. You can quickly put your finger on any article from books, journals, or newspapers. When it comes time to print your bibliography, Bookends outputs your bibliography in almost any style without reentering references. \$99.95. Sensible Software, Inc., 335 E. Big Beaver, Ste. 207, Troy, MI 48083, 313/528-1950

Desktop Publishing



- Leading OCR software developer Support MAC & PC/XT/AT/PS2
- Read text from documents, form, books and magazines using "SPOT" OCR program Trainable for English and foreign
- language characters Works with most scanners

- FAX and networking capability
 Customized software available
 Large inventory of Canon,
 Panasonic and HP scanners
 Free "SPOT" demo program Avoid the middleman-Go directi

FLAGSTAFF 602-779-3341 ENGINEERING FAX 779-5998

CIRCLE 719 ON READER SERVICE CARD

Japanese Desktop Publishing

日本醫出版 EGBook ™



- *Supports vertical, multi-column formats
- *Supports Kanji JIS level I and II
- *Compatible with KanjiTalk 2.0
- *Compatible with EGWord 3.01 縦書き編集や枠あけ編集、簡易図形 編集など多彩な高機能を満載した EGBook.DTP環境を強力にサポート.

Req. 2MB RAM Dealer inquiries welcome.

*EGWord \$499, *EGBook \$599, *EGW&B Bundle Set \$799.

Qualitas Trading Co. 6907 Norfolk Rd., Berkeley, CA 94705 Order: 415-848-8080 Info.: 415-848-5815 Fax: 415-848-8009

Developed by ERGOSOFT Corp.

CIRCLE 743 ON READER SERVICE CARD

MacPalette

By Microspot, prints multicolored graphics & text from most Macintosh® software using the ImageWriter II. MacPalette will colorprint documents from MacDraw, MacDraft MiniCad, MacProject, MacWrite, JAZZ, Microsoft Chart, Word, Excel, etc. (not MacPaint.) It prints black as a true black instead of mixing a black, \$69. CompServCo, 800 Freedom, Slidell, LA 70458, 800/272-5533 or 504/649-0484

Document Mgmt.

MacDocument[™]

New Document Management System powerful enough to index an entire public library. Manage journals, articles, mail, office correspondence - any written information. Locate documents with only a mouse click. Isn't it time you finally got organized? \$295.00 or \$15.00 for a Demo disk. Call now! MC/VISA.

Kentrex, Inc., Suite 85, 806 Broad Street, Chattanooga, TN 37402 800/888-5368.

Educational

Teacher's Rollbook

Teachers: The first program that handles all your record keeping needs. Grade averaging and reporting. • Full attendance records and totals . Records disciplinary actions . Class size reports • Up to 315 students per file • Remembers birthdays & checked out items • Requires Mac 512K,+, SE, II, 2 drives • Demo \$10

Current Class Productions, 22824 Berendo Ave., Torrance, CA 90502, 213/326-4246

ANNOUNCING TWO NEW PROGRAMS FROM DAEDALUS.

GraphPaper"

Custom-Made Graphpaper at the click of a mouse. ANY number of blooks per inch. horizontally and vertically, square or rectangular. If you wish, emphasize inch lines, change line hickness. English, metric, logarithmic, polar-coordinate. An infinite number of different types for only \$13.00, postage included. (This software probably won't improve the quality of your life in any substantial way, but it does make fine graphpaper.)

MacChematics™

A unique, interactive teacher/rester/replainer for the most important aspect of Chemistry, Chemical Mathematics, H.S. and College students can learn at their own rate by settling the numerous parameters to control the topics and levels of difficulty of the explanations and questions. Two hours with MacChematics* can prevent two terms of anguish. Only \$1700, postage included.

DAEDALUS SCIENTIFIC SOFTWARE P.O. BOX 787 DEPT. MW OAKLAND GARDENS, NY 11364 (718) 423-3881

TEACHERS: Send for info on our totally different Chemistry and Physics Teachers' Test Makers

CIRCLE 622 ON READER SERVICE CARD

MacKidsTM

Call or write for your free catalog of Macintosh™ educational programs. Written especially for preschool to elementary students. \$39.95 each, VISA/MC accepted.



800-228-0417

NORDIC SOFTWARE 3939 North 48th Lincoln, NE 68504 402-466-6502

CIRCLE 657 ON READER SERVICE CARD

An all new edition of the Macintosh Educational

Software Collection

- Hard-to-Find & Best Sellers
- HyperCard / Shareware
- Over 150 Titles
- All Subject Areas
- Teachers, Students, Parents Send for Free Catalog!

CHARIOT •3659 India St. • San Diego, CA 92103 (619)298-0202

NOW Available!! MicroTest III Reasonably priced full featured **Test Generation**

Large database • Auto Question Select • Easy to Use • DA Graphics Editor **GUARANTEED!!**

Ask for our Special Buy on MicroTest III & MicroGrade.





■The Macworld Catalog

Educational

TEST GENERATION AND SCORING!

LXR. TESTTM - the only complete testing system for the Mac! Rated "best testing tool on the market."

Logic eXtension Resources 9651-C Business Center Drive Rancho Cucamonga, CA 91730 (714) 980-0046 AppleLink; D0626

CIRCLE 649 ON READER SERVICE CARD

Kieran

Integrated learning program for children 2-6 yrs. Uses child's name in speech and pictures. Totally mouse driven interactive program with iconic interface. Covers alphabet training, time telling, counting skills, upper-lower case, and mystery door! 4-mice rating in MacUser. Great gift! MC/VISA \$39.95. Ohm Software, 163 Richard Dr., Tiverton, RI 02878, 401/253-9354, 800/346-9034

Algebra Homework Tutor

Revolutionary Homework TutorTM lets you do your Algebra homework or classwork on a Mac. Checks each step you enter, gives hints, poses practice problems, solves and explains examples, and prints completed homework. Easy editing, standard Mac interface and too much more to tell. Send for free brochure. Missing Link Software, Box 3280, South Amboy, NJ 08879, 201/721-2569

Make Learning Fun!

MacRobots * Read-A-Rama **Animal Kingdom**

Math Wizard * Fraction Action **Decimal Dungeon**

To order programs or to receive a free

brochure call or write:
UNICORNYM
EDUCATIONAL SOFTWARE Dept MW 2950 E. Flamingo #B Las Vegas, NV 89121 702-737-8862 FAX 702-737-9085

MacAnatomy

A complete electronic atlas of human anatomy in MacPaint document form. The drawings may be modified and merged into MacWrite documents using the Clipboard. Comprised of four volumes, available singly or as a collection.

MacMedic Publications Inc.. 7530 Harwin Dr., Houston, TX 77036, 713/977-2655

Engineering

TRUCTURAL-SURVEYING



NEW VERSION!! LANDesign...
for surveying & land & road layout.

- Import/Export data; radial stakeout; log; sideshots.

 All information is displayed graphically at all times.

 Polints, lines, curves, boundaries and traverses can
 be added, changed, copied, pasted, and duplicated
- FRAME mac, BEAM mac 2, BEAM mac; for structural analysis of 2-D frames, trusses, and beams MacShapes for calculating structural properties.

All programs have full Macintoth interfaces. Money-back guarantee, free support. From \$145-5595. Visa or MC. Compuneering Inc. – (416) 738-4691 113 McCabe Crescent Thornhill, Ontario L4J 2S6 CANADA

CIRCLE 660 ON READER SERVICE CARD

Schematic Entry/Digital Simulation **Design Works**

Fully integrated and fully functional schematic and simulation on the Macintosh, featuring:

- · fully interactive digital simulation
- fully interactive digital simulation with logic-analyzer style timing display
 fully compatible with Douglas
 CAD/CAM* PCB layout
 full 7400, 4000, LSI, analog libraries
 full high level language PLD support when used with LPLC logic compiler
 determine the compiler
- dot-matrix, laser, pen plotter output
 user-definable device symbols with full simulation

DesignWorks: \$685 LPLC: \$535 Low-cost educational versions also available



- Capilano Computing 545-108th NE. Suite 6 Bellevue WA 98884 (604) 669-6343

CIRCLE 602 ON READER SERVICE CARD

MacII488 . NuBus IEEE board for MacII MacSCSI488 • SCSI/IEEE controller Mac488B • Serial/IEEE controller MacSerial488 • IEEE plotter interface MacDA488 • IEEE desk accessory MacDriver488 • IEEE language driver

Call or send for your FREE Technical Guide

(216) 439-4091



CIRCLE 702 ON READER SERVICE CARD

Electronic (

The powerful, easy-to-use Douglas CAD/CAM Professional System takes you from the schematic drawing to the final routed board with:

- · Color support on Mac II
- Unlimited multilayers
- SMT capability
 1 mil resolution
- Layout w/ parts-placement facility
 Schematic w/ digital simulation
- · Flexible, multi-pass router

Take your first step into the new age of electronic CAD by ordering a full-feature demo with all 3 programs included. Call or write to us today.

Pro. Layout: \$1500 Schematic: \$700 AutoRouter: \$700

Douglas Electronics,Inc 718 Marina Blvd. San Leandro, CA 94577

CIRCLE 680 ON READER SERVICE CARD

Scientific Plotting Package

SoftWear Plot produces publication-quality plots using multicolumn ASCII file (e.g., program outputs, text editors, spreadsheets). Linear or logarithmic formats in either axis, overlays, zoom, on-line measurements, custom labels and tokens. Number of points limited only by disk space. LaserWriter and big-screen compatible, S99.95+\$5 s/h. SoftWear Products, 7230 Oliver St., Lanham, MD 20706.

Road Design

301/577-9207

MacRoad is a fully interactive road design program that allows you to:

- Design cross sections using a palette of edge & surface types
- Design vertical gradings graphically
- · Produce a schedule of quantities
- · Adjust the grading & immediately see the effect on the cross sections & quantities
- Produce drawings on a range of printers or pen plotters Creative Engineering, 6 Antill St., Wilston Queensland 4051, Australia, +61 73566271

E(E)PROM, MICRO & MEMORY CARD PROGRAMMERS WITH INTEGRATED MAC USER INTERFACE



- · Connects to modern port. Pull-down commands menus. · No personality modules for E(E)Proms & Intel Micros
- All 24/28/32 pin Eproms to 1 MBit (upgradeable to 32 Mb).
- 8741,-2,-4,-8,-8H,-9,-9H,-51,-C51,-52,-55,9761; EEPROMS.
- · Memory Cards (Sciko/Epson,GI):Flash Eproms: On Board
- Programming capability; Modular design; Easy F/W upgrade:
- Stand alone E(E)Prom and Memory Card duplication/verify.
- · Offset/split Hex, Binary, Intel & Motorola 8, 16, 32 bit. Bulit-in Eraser/Timer option (\$50); Gang Module ready.
- Direct technical support; Full 1 year warranty.
 VISA MC AMEX Call today for datasheets!

B&C MICROSYSTEMS

355 WEST OLIVE AVE., SUNNYVALE CA 94086

CIRCLE 725 ON READER SERVICE CARD





■The Macworld Catalog



uASM 171 COP400 family 1802 family 1802 family 6502 c003 COS 6501 /6500 (6501 families 6801 /6500 (6501 families 6801 /6500 (6501 families 6804 family 8051 family 8051 family 8054 family 8054 family 8054 family 1805 (6501 family 8054 family 1805 (6501 family 8054 family 1805 (6501 family 1805 family 1805 (6501 family 1805 family 1805

US \$129.95 ea plus s/h*

Fast, Full Macintosh interface, Output downloads to most EPROM programmers, Features macros, condi-tional assy, local and automatic labels, symbol table cross-ref, module sectioning. Editor included. MC/V.

Micro Dialects, Inc. Dept W PO Box 30014 Cincinnati, OH 45230 \$4 cont. USA \$8,50 Can. AK.HI \$15 overseas Cincinnati, OH 45230 (513) 271-9100 MCI Mail MICRODIALECTS

CIRCLE 608 ON READER SERVICE CARD

Entertainment

Pardon me, boys, is this the MacInooga Choo-Choo?



true-to-life electronic train set!

You can build eleborate model railroad systems on your MacIntosh and bring them to life with the click of a switch. You simply place desired images of tracks, engines, cars, and terrain on a grid in any configuration. Build layouts of one screen or more. Run your train at night. Use MacPaint to create more screen.

Abracadata

Box 2440, Dept. M Eugene, OR 97402

VISA/MC/AMEX (503) 342-3030

CIRCLE 676 ON READER SERVICE CARD

Rotisserie League Baseball



Thrill for Baseball Fans since Baseball. Thrill for Baseball Fains since Baseball. Experience the excitement of managing your own Major League Franchise. Draft Major League players and battle for the pennant. Game maintains teams, league standing, waivers, trades, reserves, player stats and the official Rotisserie League rules

"A must for any Fan !"
"A must for any Fan !" Start your own office or neighborhood league Order Now, Don't miss the 1989 Season. Premier Software Only \$34.95

Irvine, CA 92720

Only \$34.95 Shipping Included Visa or MC

(714) 731-7257



Corrales Software Post Office Box 2730 Corrales, NM 87048 505-897-4024

BirdSonas!

Improve your office environment - play bird songs in the background while you work with your Macintosh.

BirdSong Player: \$40. 700k of American bird songs included. Additional specialty bird songs: \$15 per disk.

Mac 512ke or better required. MultiFinder & Network friendly. DA & HyperCard versions also available.

CIRCLE 664 ON READER SERVICE CARD



Tired of Arcade Games? ions: Rommel's DESERT WAR . MIDWAY or SOLOMONS (carrier actions) . Rome's In BARBARIAN OF EAGLES IN THE SAND . WESTERN CAMPAIGNS OF THE ARMY OF NORTHERN VIRGINIA (Civil War) - NORWEGIAN SEA or U.S. invasion in RED STARS (U.S./Soviet clashes) \$34.95 each game or \$64.95 for two, 512K Minimum. VISA and MC Accept SJP Enterprises PO Box 246 MCHenry IL 60050

CIRCLE 710 ON READER SERVICE CARD

Fonts

Beverly Hills

"Best ImagewriterTM font available!"

"Typeset" look, 11 sizes, 6-36 pts. Multi-digit fractions; horiz. lines Fine spacing, math/musical symbols Includes disc, 70-p. printed manual Two compatible versions available:
• v 2.0 (ImageWriter I or II): \$29.95
• v LQ-1.0 (IW LQ, Mac +): \$39.95
Direct orders, add \$3.00 S/H (plus \$1.80 or \$2.40 sales tax in Calif.) Site licenses; dealer inquiries invited

ADH Software P.O. Box 67129 Los Angeles, CA 90067-0129

CIRCLE AAR ON READER SERVICE CARD

DOWNLOADABLE LASER WRITER FONTS

FOR SCIENCE aA VαβγΦΨ£∮∓!I



FOR FOREIGN LANGUAGE TEXTS Μηνιν ἄειδε θεά, Πηληϊάδεω 'Αχιλήος aezézisn A E Z CZŁŚŃ

ALLOTYPE TYPOGRAPHICS 1600 PACKARD ROAD SUITE 5 ANN ARBOR, MICHIGAN 48104 (313) 663–1989 Compatible with all Macintosh systems

CIRCLE 615 ON READER SERVICE CARD

MacScuba[®]

Have you ever dreamed of scuba diving in some exotic port in seach of sunken pirate treasure?

The Ultimate Mac Simulator

MacScuba simulates the underwater world using Mack's 3D graphier and dighthed sound. You control all aspects of scubs diving from filling your tank to doing decompression diver using the U.S. Navy divertables. Fight off killer tiger and harmenhead sharks while you explore a sunker plrate wreck in search of treasure. Fur for the experienced diver

Paradise Software Corp. P.O. Box 50996 Phoenix, AZ 85076

(602) 893-8324

CIRCLE 732 ON READER SERVICE CARD



Go, a game of strategic elegance, has been a way of life in the Orient for over four thousand years. Many consider Go to be the secret of the Japanese businessman's sucess. "While chess is a game of war, Go is a game of market share [President of Nikko Hotels].

"If you are interested in Go, buy this program." J.Pournetle

Toyogo, Inc. (617) 861-0488 76 Bedford Street, #34-C, Lexington, MA 02173 \$79 Go Master®, \$49 Joseki Tutor™, \$59 Tactical Wizard™ Add \$6 U.S. S&H CIRCLE 693 ON READER SERVICE CARD

Custom Laser Typography

Complete line of LaserPerfect Fonts. Distinctive, downloadable fonts features legibility, good fit, kerning. Fine type: adaptations of Bembo, Gill Sans, Granjon, many others. Foreign: Hebrew, Ancient & Modern Greek, Hindi, Cyrillic. Also: Fractions, Bar code, Phonetic, OCR-A, LCD. \$55-125. Logo conversions, custom fonts. Free samples and estimates. Neoscribe International, P.O. Box 633, East Haven, CT 06512, 203/467-9880

CIRCLE 675 ON READER SERVICE CARD





The Macworld Catalog **Fonts**

FONTagenix[™] ot-matrix display and text fonts ARTagenixTM Collection of graphics LASERgenixTM Cyrillic, ipa, others \$3950 ea.

FOREIGN FONTS EDITIONIM

22 foreign language fonts on one disc $$69^{50}$ Customized Fonts & Logos Available All Orders add \$3 s/h, CA res. add 6% tax (714) 621-0973 **DISC**

Devonian International Software Company P.O.Box 2351 Montclair, CA 91763

CIRCLE 683 ON READER SERVICE CARD

HyperFamily-Tree™

The HyperCard stack that lets you easily record and graphically display genealogy information including digitized photos of your relatives. Auto-link lets you click-to-navigate through generations of your family. Creates, prints and exports pedigree charts, family group sheets, family lines, mailing labels, birthday calendars & peson sheets. \$59.95 plus \$3 s&h. VISA/MC orders welcome. Leister Productions, 14 Hill Blvd., Mechanicsburg, PA 17055, 717/697-1378

Graphics

MacPerspective

It's simple and easy to construct accurate perspectives on screen with dimension coordinates input by relative commands. (Left/right - up/down - forward/back)



KNICK DRAFTING, Inc. (407) 777-0275 1275 S. Patrick Dr. Ste. P, Satellite Beach, FL 32937

CIRCLE 739 ON READER SERVICE CARD

MiniCAD 3.0

By Diehl Graphsoft, boasts 1000+ power zoom, symbol library, 40 layers, auto-dimensioning, double-line tool, clip/ add/intersect polygons tools, object snap, fillet & trim-lines tools, object sizer & locator, 9 decimals accuracy, full 2-D & 3-D modes, etc. It reads MacDraw & MacDraft files. \$495. Demo avail. CompServCo., 800 Freedom, Slidell, LA 70458, 800/272-5533 or 504/649-0484

Health

Analyze Diets, Menus...

so much more with the FOOD PROCESSOR II! This TOP-rated software has the best database of any system on the market today! Acclaimed by schoolscolleges-hospitals-homesfitness centers & businesses. • 2400-3000 foods - 30 nutri-

ents. \$250 • CALL OR WRITE TODAY FOR

FREE DEMO DISK! ESHA Research, P.O. Box 13028, Dept. D. Salem, OR 97309, 503/585-6242 or 585-7755

Fund Raising

Community Contact Sys.

A unique approach and solution for nonprofits to more effectively communicate to the public they serve. The system enables organizations to increase fund-raising, public relations and marketing activities. Macintosh and the Community Contact System. Set yourself apart! Call today.

Campagne Associates, Ltd., 9 Goldfinch Lane, Nashua, NH 03062, 603/891-2129

Family Roots™

Do it YOUR way! Huge variety and capacity for your family history. Make pedigree charts, descendants charts, person sheets, group sheets, indices and much more. Customize to your own preferences. Standard Mac interface. Call for FREE information. Satisfaction guaranteed. MC/VISA/AE. Quinsept, Box 216, Lexington,

MA 02173, 617/641-2930, 800/637-ROOT

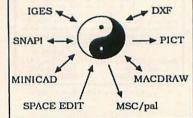
MacPlot & MacCAD

MacPlot by Microspot is a powerful plotter driver that will plot any object-oriented graphics produced on the Mac in up to 30 colors/pens. MacPlot supports over 50 plots. MacCAD is a series of 12 separate architectural & engineering template symbol libraries for use with MacDraw, MacDraft, MiniCAD,

CompServ Co, 800 Freedom, Slidell, LA 70458, 800/272-5533 or 504/649-0484

CADMOVER

GRAPHIC TRANSLATION UTILITY MACINTOSH CONNECTIVITY



KANDU SOFTWARE CORP. 703-532-0213 CIRCLE 661 ON READER SERVICE CARD

Genealogy

MacGene™ new (ver. 3.10) 80% faster & 100%complete. Designed specifically for the Mac. One program for data entry, find, list & charting.

Features: History, Hints, Mail-List, Family Tree, Pedigree, Statistics, Biography, etc. • LDS compatible • Mac's & Mac-XL

• MORE NOTES • User Fields Custom Reports •Import/ Export •No copy protect •80pg. manual •S-back guarantee \$145. Demo \$25.

Applied Ideas, Inc., P.O. Box 3225, Manhattan Beach, CA 90266, Free info: 213/545-2996

Hyper Family-Tree™ the family tree stack

The Hypercard stack that easily records and graphically displays genealogy information including digitized photographs of your relatives. Keeping track of your family was never so much fun! Click-to-navigate thru generations of your ancestors. Create, print and export pedigree charts, descendant charts, family group sheets, family lines, mailing lists and labels, birthday calen-dars, and person sheets. \$69.95 plus \$3 s&h. Visa/MC orders welcome.

717-697-1378 **Leister Productions** 14 Hill Blvd., Mechanicsburg, PA 17055

CIRCLE 623 ON READER SERVICE CARD

Investment

The Right Time System

The Stock, Index & Futures programs generate accurate Buy/Sell signals for individual stocks, indexes and commodities. The software was developed by an expert portfolio manager for his own personal use & are now available for any smart trader who wants to make quick profits. Call or write for free info. T.B.S.P. Inc., 2265 Westwood Blvd. #793, Los Angeles, CA 90065, 213/312-0154





■The Macworld Catalog■



Languages

MACTRAN PLUS

The versatile Integrated Madefor-Mac Development System •Includes: Editor, Optimizing Compiler, Source Level Debugger, Linker, Library Manager •Supports: 68020/68882 in-line code generation. Significant VAX FORTRAN & ANSI 8X extensions. Comprehensive MAC Tool Box Interface. Unlimited code segment size. DCM DATA Products, 1710 Two Tandy Center, Fort Worth, TX 76102, 817/870-2202

Medical

Medical Office Mgmt.

Tess System[™] software for insurance and billing. Expandable line to grow with your needs. Our \$650 package outperforms software selling at three times that price. Multiuser & electronic claims available. Call for Demo software, VHS tape, or documentation. System prices from \$650 to

Wabash Medical Resources, Inc., 4727 Shireton Court, Indianapolis, IN 46254, 317/299-7800

FORTRAN in MPW

Language Systems FORTRAN is a full featured FORTRAN 77 compiler integrated w/MPW. Full ANSI FORTRAN 77 plus VAX-type extensions. SANE numerical calculations & data types incl. COMPLEX*16. 68000, 68020 and 68881 object code. Arrays greater than 32K. Link with Pascal, C, MacApp. \$304 w/MPW via air. Mac+, SE, MacII. Language Systems Corp. 441 Carlisle Drive, Herndon, VA 22070, 703/478-0181

Fortran on Your Desktop

No need to wait for time on the "big" computer any longer. Language Systems Fortran lets you run the same high performance Fortran programs at your desk. VAX-compatible extensions, high precision IEEE floating point data types, complete access to Toolbox, direct code generation for the Mac II, and the MPW programming environment make this compiler the most powerful Fortran for the Mac. Language Systems Corp., 441 Carlisle Drive, Herndon, VA 22070, 703/478-0181

CMAMedical CMADental



AppleShare, Corvus, TOPS

12th

CMA Micro Computer 55888 Yucca Trail, Suite 5 Yucca Valley, CA 92284

Solo and multipractitioner office management systems for the Maciniosh 512KE, Plus, SE and II. Compare these features:

Paper Claims Electronic Claim Files SuperBill Patient

Ledgers Financial Histories

Appointments with Recall Management Reports Production

Analysis Responsible Party Billing Audit & Backup Patient Labels MacServe File Interchange

Please Call (619) 365-9718

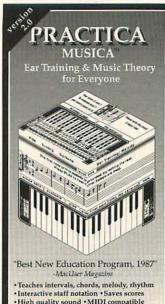
CIRCLE 673 ON READER SERVICE CARD

MedOuest™

Our program handles all the routine medical office tasks: e.g., patient & third party billing, DX & procedure tracking with recall, appointments and practice analysis. MedQuest is running in over 180 medical offices, support & training available. Single or multi-user version \$2,495 & demo \$50 (+, SE, MacII).

The Program Workshop, Inc., 159 Marine Street, Suite 6, Anderson Gibbs Bldg., St. Augustine, FL 32084, 904/829-6500

Music/Midi



- ·High quality sound •MIDI compatible • Historical & computer-generated melodies • Custom ear training melodies
- \$125 Call Toll Free 800-445-4866. In CA: 800-445-8749

ARS NOVA BOX 40629, SANTA BARBARA, CA 93140

CIRCLE 699 ON READER SERVICE CARD

Call 1/800/FOR MIDI

MIDI for everyone! Start your computer/MIDI system today with discount prices & expert help from FUTURE MUSIC. You don't have to be a PRO-most of our customers are just "plain folks" with a home computer and a love of music. Call for FREE CATALOG of Hardware, Software, Synthesizers, 4-tracks and more. All major brands avail. Future Music Inc., 489 E. Plumb Lane, Reno, NV 89502. 702/826-6434

Mac to MIDI Made Easy!

Make the Right Choices We have designed MAC based system for headline superstars and 1st time users. We offer:

- · Expert advice Complete systems design. We sell: • All MIDI interfaces, software, accessories
- All major synths & samplers At discount prices. Why settle for less than the best? TekCom Corporation, 1020 N. Delaware Ave., Philadelphia, PA 19125, 215/426-6700

Good Sound Advice!

Beginner, professional, solo or ensemble-Soundware carries the best MIDI products for your musical needs. Our commitment is providing you with the best product information, values and support available. Complete MIDI starter packages from under \$250! Call today for our FREE CATALOG

(800) 333-4554

soundware' 000000000000000

200 Menio Oaks Dr. Menio Pk CA 94925 (415) 328-5773

CIRCLE 747 ON READER SERVICE CARD

Networking

ScreenShare

ScreenShare is a software product which enables an instructor to do demonstrations in a classroom of networked Macintosh computers. ScreenShare broadcasts the contents of an instructor's Macintosh screen to the screens of the students' Macintoshes while temporarily suspending the students' work. ScreenShare for a classroom \$249 (\$295 Canada). White Knight Software Corp., P.O. Box 564 - 810 West Broadway, Vancouver, B.C. Canada V5Z 4C9 (604) 290-4855







Personnel

ABRA 2000MAC — \$995

First HRIS on Mac. Magically cuts paperwork! Complete employee record keeping system for companies up to 7000. Tracks: Personal Info, Job History, Benefits, Skills and user-defined events. More than 50 built-in reports, 1000+ happy customers. Test "The Magic". Send \$25 for Demo & Manual. Abra MacDabra Software Company, 485 Pala Ave., Sunnyvale, CA 94086, 408/737-9454

FREE PUBLIC DOMAIN & SHAREWARE CATALOG

Lowest Price **Best Quality** Fast Service

Over 1000 Macintosh Software

Write to: SOFTSHOPPE POB 709, Ann Arbor, MI 48105 (313) 763-8721

CIRCLE 749 ON READER SERVICE CARD

Real Estate

LOAN AND LEASE TRACKING



Demo Disk Softflair, Inc. Available 8753 Parkview MC/VISA Milwaukee, WI 53226

- Receipts easily.
- Keeps up-to-date records for Principal & Interest Payments, Penalties & Balance
- Ideal for Note Holders, Lending Institutions, Landlords, & Equipment Lessors.
- · Great for payments which vary in
- amount & date paid or received. Use it for record keeping, what-if

analysis & client reports. Call or write for FREE brochure, sample reports, & screens.

(414) 797-4490 \$69.95 Add \$5 S/H

CRCLE 723 ON READER SERVICE CARD

Public Domain

Free Custom Software!

Don't buy public domain software you don't want! Pick the programs you want from our catalog of thousands P.D.-S.W. programs to create a custom disk. We do not charge for programs, pay only a small fee for producing a custom disk. No club fees. Prices as low as \$2.90 per disk. Call now for a free catalog!

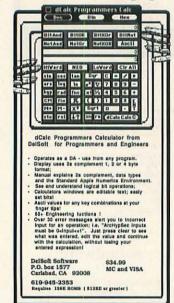
Software Supermarket, 5101 Addison Dr., Charlotte, N.C. 28211, 800/438-1242 Ext. 515, in N.C. 800/534-0476 Ext. 515

You Pick It!

Tired of getting what they want to send you? Choose an 800K disk of what YOU want from our library of over 300 meg of high quality shareware & public domain software, graphics, games, DA's, fonts, utilities & stacks. ONLY \$15. Prices reduced for multiple disks. Send \$5 (refundable) for a catalog. HK Distribution, P.O. Box 201432, Austin, TX 78720-1432 (512) 331-8170

Programming Tools

Our Minds are Merging. .



CIRCLE 623 ON READER SERVICE CARD

Property Management

Comprehensive program for managing residential and commercial properties. Many management reports, including operating statement, delinquent rent, lease expiration, and transaction register. Provides check writing, check reconciliation, posting late fees, recurring expenses-\$395.Deluxe Property Management Program - \$1195. Yardi Systems, 813 Reddick St., Santa Barbara, CA 93103. 805/966-3666

REMS Investor Series

CCIM recommended, Multi-year cash flow projections and analysis, amortization, depreciation, tax calculations, and export to Excel. REMS Investor 3000 imports from Excel, handles partnerships, ground leases, participation loans and more. Not a template.

REMS Investor 2000 (\$395) REMS Investor 3000

\$795

GOOD Good Software Corp.

13601 Preston Rd. Suite 500W, Dallas, Texas 75240 1-800-272-GOOD

CIRCLE 679 ON READER SERVICE CARD

Real Estate Software

Ten Minute

Property Manager

Accounting system for multiple properties. Ideal for investors who manage their own properties.

■ ProAnalysis

A Sophisticated investment analysis program designed for the investor who demands professional quality analysis.

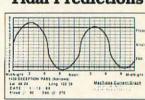
Demos Now Available!

Metropolis 499 Hamilton Ave., Suite. 202 Palo Alto, CA 94301 (415) 322-2001

CIRCLE 689 ON READER SERVICE CARD

Recreational

Tidal Predictions



MacTides: Current & tide height plots, tables & more: 5400 stations on 5 discs: valid 'til 2010: \$99/disc + \$3 sh. MC/Visa, Info: 1 (800) 999-5221. Nautasoft Inc., Box 282, Rockland, DE 19732

CIRCLE 688 ON READER SERVICE CARD





The Macworld Catalog ■



New dimensions in Bible study



THE WORD processor A comprehensive Bible study program. Instant access to any verse in the Bible. You can search for any word or phrase and build indexes to record your study. Separate windows for comparing various verses and translations. Only \$199.95

> Our family of products Choose from NIV, RSV, KJV or NKJV text. Add Greek or Hebrew transliterators or topical cross references, personal commentary, a chronological Bible and chain references. Our memory resident VERSE TYPIST transfers verses to your word processor.

Bible Research Systems (512)251-7541

2013 Wells Branch Parkway #304 Austin, Texas 78728 Postage extra. For IBM, MSDOS, MacIntosh. Some products for Apple II.

CIRCLE 665 ON READER SERVICE CARD

The Macworld Catalog is the direct response section for the Macintosh marketplace. It's actionoriented advertising that reaches the experienced users who know what they want, want it fast, and look for it here-each and every month.

The most readers. The least cost. Immediate access. Just call The Macworld Catalog at 800.888.8622 and place your ad-today!



800.888.8622

Rental

Mac Software Rentals

Try before you buy...We have a complete inventory of Macintosh software, including hard to find programs, ready for your evaluation. Of course your rental fee is applied to the regular low price, should you decide to purchase.

In addition to software, we stock a full line of Mac peripherals, such as hard drives, full-page monitors, and modems at low discount prices.

Call for our free catalogue.

From California: 800 426-2777 **Outside California:** 800 622-4774

FAX:

714 879-7422







■The Macworld Catalog

Retail



Retail Engine - The complete point of sale software system for apparel stores with up to 10 locations. Retail Engine eliminates steps, allowing you to save time and improve productivity. We are committed to quality support because our success comes from your success.

> Houlberg Development PO Box 1515OI San Diego, CA 92115 (619) 287-7444

CIRCLE 714 ON READER SERVICE CARD

Sales/Marketing

MarketMaster for Mac

MacGuide calls it "the best sales lead follow-up you can buy". Enter leads whenever you get them and MarketMaster™ contacts the right people the right way at the right time. Prints letters & envelopes, phone lists, scripts, and NEVER FORGETS! Easy to learn and use. Frees salespeople to SELL and supports them to SELL MORE! Breakthrough Productions, 10659 Caminito, Cascara, San Diego, CA 92108, 619/281-6174

Scientific

Geological Software

Great graphics, low prices! Lithologic log plotting

 Gridding • Contouring • Piper/ Stiff plots •Oil & Gas economics •Stereonet plots •Plate tectonics . Geophysical modelling, +much more for the Macintosh & PC \$50-\$1500. Call or write for FREE catalog of easy-to-use software products.

RockWare Inc., 4251 Kipling, Suite 595, Wheat Ridge, CO 80033, 303/423-6171, Telex: 9102504964

Equations Made Easy

"An excellent toolkit that all technical people should have..."- Jean Louis Gassée. VP, Apple Computer, Inc.

Expressionist[™] 2.0

A powerful application and desk accessory that generates $\mathbf{B} = \frac{\mu_0}{4\pi} \int \frac{\mathbf{J} \times \mathbf{r}}{\mathbf{r}^2} d\mathbf{t}$

allan bonadio associates 814 Castro #56, SF, CA 94114, (415) 282-5864 \$129.95 CIRCLE 690 ON READER SERVICE CARD

Statistics

RATS! Version 2.1

Best-selling econometrics software program. Now available on the Mac. Multiple regression, including stepwise, 2SLS, logit, probit, and much more! Forecasting with ARIMA, VAR. Exponential smoothing, model simulations, support for daily/ weekly data. \$300. VISA/MC. 512K+external drive. VAR Econometrics, Inc., P.O. Box 1818, Evanston, IL 60204-1818, 312/864-8772, 800/822-8038

Utilities

MacLabeler® Plus



the Label Construction Set

- Custom design your disk labels
- Put fields anywhere · Save templates
- Automatic labeling · Batch printing
- · Color, icons, fonts, graphics! · Supports Mac II, LaserWriter, etc.
- With 60 QuickLabels[®]. \$79.95

Ideaform Inc. (515) 472-7256 PO Box 1540, Fairfield, IA 52556 Visa and MasterCard accepted.

CIRCLE 65B ON READER SERVICE CARD

Miscellaneous **BusinessOpportunities**



THE MAC UNDERGROUND WANTS YOU IIII The demand for our on-line electronic magazine for the Mac is more than we can handle. Distribute our magazine, hardware & software products in the US, Can., U.K., Australia, Far East or Europe. We offer:

· EXCLUSIVE TERRITORIES · · PROVEN MARKET ·

· SMALL INVESTMENT - BIG RETURNS · TECHNICAL and SALES SUPPORT
Have fun and make \$\$ with your Mac! You can launch this

business from your home or existing business, and expand from there. For further information...

MAC UNDERGROUND, 1180 South 1300 East, Salt Lake City, Utah 84105 USA (801)-582-1676

CIRCLE 670 ON READER SERVICE CARD

Word Processors

CLR ANOVA

Analysis of variance program that can compute up to a 10way design with repeated measures and unequal n. Marginal means, plots of interactions, simple effects, range tests, contrasts, and more. Full Mac interface. Can read text files w/ entries separated by spaces, commas, or tabs, \$100 + \$3 s/h. Clear Lake Research, 5615 Morningside #127, Houston, TX 77005, 713/523-7842

Japanese Software

- New Kanji Pagemaker 2.0: Japanese DTP. Int'l, standard w/professional quality, \$995.
- New EGBook 1.2: Japanese DTP. Supports vertical format.
- New EGWord 3.0: Japanese WP. Auto kana-kanji conversion. \$499.
- EG Word & EGBook Bundle. \$799 New MacVJE 1.0: Japanese FEP. S249.
- · MacKanji 2.0: Japanese FEP. \$99.95. All Req. 2MB RAM.
- NewSweetJAM v.3.51: Japanese FEP. \$249. Reg. 1MB RAM. Distributed by Qualitas Trading Co., 6907

Norfolk Rd., Berkeley, CA 94705, 415/848-8080 or 415/848-5815

Mailing Lists

MAILING LIST of Mac Users

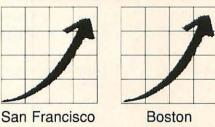


Only 5¢ per name, with no charge for selecting, sorting, media, or delivery. Semaphore Corporation, 207 Granada Dr., Aptos, CA 95003 (408) 688-9200 (voice) 662-2717 (modern)

CIRCLE 611 ON READER SERVICE CARD

Find out what's up at MACWORLE

Attendance 1985 - 1988



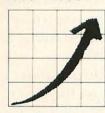
Up 166%

Up 144%

Expo Booths 1985 - 1988



Up 300%



Boston Up 280%

You can always count on seeing the newest, the best and the most at MACWORLD Expo. That's why, year after year, the original Macintosh-exclusive computer show keeps getting more and more popular, both for users and for vendors.

Fact is, MACWORLD Expo will:

- · Save you time and money . . . by literally putting at your fingertips the hardware, software and peripherals that represent the entire state of the art of Macintosh™ computing. You'll make smarter buying decisions.
- Build your knowledge . . . by enabling you to attend a helpful tutorial that meets your specific need, whether you use your Mac at the office, at school or at home. You'll learn from the experts.
- · Develop your skills . . . by giving you plenty of opportunities to practice what you've learned, using one of the many Macintoshes that will be available to you. You'll get hands-on experience.

The number of MACWORLD Expo cities is up too.

Now our nation's capital joins San Francisco and Boston in hosting MACWORLD Expo. You'll see special emphasis on the products, systems and applications representing the specific needs of government agencies and operations.

Pick from these Expos still to come in 1989:

WASHINGTON, DC April 26-28, 1989 DC Convention Center

BOSTON

August 10-12, 1989 Bayside Expo Center • World Trade Center

The next move is up. Just fill in, detach and return the coupon below to MACWORLD Expo, Box 155, Westwood, MA 02090. We'll mail you the information you need to: get a special reduced rate on your admission, avoid the registration lines and make the most of your time learning what's up.

What's up, MAC?

Please send me details about attending the following MACWORLD Expo:

- ☐ Washington, DC April 26-28, 1989
- ☐ Boston, August 10-12, 1989

Name

Company _

Street City _

Phone

show not affiliated with Apple Computer, Inc. MAC, MACINTOSH and MACWORLD are trademarks of Apple Computer, Inc.

Sponsored by MACWORLD, the Macintosh TM Magazine. An IDG Communications publication. MACWORLD Expo is an independent trade



Macworld Best-Sellers

Months on chart	Last month	This month	Business Software	Months on chart	Last month	This month	Hard Disks*	
26	2	1	Microsoft Works Microsoft	4		1	SD Macstack 30 CMS Enhancements	
47	1	2	Microsoft Word Microsoft	14	4	2	FX20 General Computer	
38	3	3	Microsoft Excel Microsoft	4	-	3	EMAC 20 External Everex	
34	4	4	PageMaker Aldus	22	2 – 4 Apple Hard Disk 20SC			
23	5	5	MacWrite Claris				Apple Computer	
6	10	6	QuarkXpress Quark	3		5	DataFrame 30/XP30 SuperMac	
2	8	7	FreeHand Aldus				Technology	
7	6	8	WordPerfect for the Macintosh WordPerfect					
7	7	9	Adobe Illustrator/Illustrator 88 Adobe Systems				Add-In Boards	
36	-	10	MacDraw Claris	17	1	1	Radius Accelerator Radius	
				4	3	2	Radius Interface Display Radius	
				4	4	3	Mac286 AST Research	
			Education Software	15	-	4	Apple 1MB Memory Expansion Kit Apple Computer	
1		1	Where in the World Is Carmen Sandiego? Brøderbund	16	2	5	Apple 2MB Memory Expansion	
14	1	2	Reader Rabbit The Learning Company				Kit Apple Computer	
30	2	3	Math Blaster Davidson & Associates					
27	4	4	KidsTime Great Wave Software				Product Watch	
27	3	5	Typing Tutor Simon & Schuster			8		
			Computer Software	Editors' choice of other recent or forthcoming products of particular interest.				
			Entertainment Software				Adobe Streamline Adobe Systems tracing program that converts bitmaps to EPS files	
29	2	1	Flight Simulator Microsoft				Oracle for the Macintosh Oracle	
26	3	2	Dark Castle Silicon Beach Software				Corporation SQL database	
10	5	3	Beyond Dark Castle Silicon Beach Software				Smart Art Emerald City Software	
30	1	4	MacGolf PCAI				library of PostScript text effects and graphics	
1		5	Shufflepuck Cafe Brøderbund					
			Networking/Data Communications				Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected	
26	1	1	TOPS TOPS				mail-order vendors. Covers sales during	
22	4	2	AppleShare Apple Computer				December 1988.	
17	3	3	PhoneNet Farallon Computing				*Description of head with the state of	
30	2	4	LocalTalk Apple Computer				*Does not include bard disks installed at the factory.	
2	5	5	MacLink Plus DataViz					

The WriteNow difference: Ease, Performance, and...

	weeken Totaler		wicrosofts	Morosoft Morosoft
	WriteNow 2.0	MacWrite 5.0	MS Write	MS Word 3.01
Spelling checker size	100,000 words	100,000 words	80,000 words	80,000 words
Font size range	4-127 pts.	7-24 pts.	7-72 pts.	2-127 pts.
Maximum recommended document size (in pages)	Over 2,000	240	50	500
Number of open documents	Unlimited *	1	30	30
Mail merge	Yes	No	No	Yes
Number of editable, on-screen columns (WYSIWYG)	4	1	1	1
On-screen auto-numbering footnotes	Yes	No	No	No
Automatic repagination	Yes	Yes	No	No
Graphics in same line as text	Yes	No	Yes	Yes
Multiple headers and footers	Yes	No	No	Yes
Extensive Undo	Yes	No	No	No
Variable line spacing (in points)	Yes	No	No	Yes
Selective font, size, style, and ruler changes	Yes	No	No	Yes
MacUser Magazine's Best New Word Processor	Yes	No	No	No
Search for a word	2.4 sec	7.6 sec	9.5 sec	9.7 sec
Spell Check document	6.3 sec	2 min 34.0 sec	2 min 2.3 sec	1 min 48.0 sec
Copy & Paste large area	6.8 sec	1 min 0.9 sec	12.4 sec	12.3 sec
Change font size of document	10.7 sec	50.2 sec	17.6 sec	16.2 sec
Change font of document	10.8 sec	37.1 sec	14.1 sec	15.2 sec
'Save As' a 12-page document	3.6 sec	9.4 sec	20.3 sec	19.6 sec
Retail Price	\$195	\$125	\$175	\$395
Happy Users	Yes	?	?	?

...Happy Users!

Our users love WriteNow—a claim our competition can't easily make for their products.

How do we know? Because our users tell us—on registration cards, on the telephone, on bulletin boards, and in letters.

We've heard dramatic stories about how WriteNow has significantly reduced training and support costs. And how clean, fast, and enjoyable it is to use. And how WriteNow got the job done when our competition sputtered.

You see, at T/Maker we feel a great word processor is more than just a stockpile of features. It's the *usability* of those features—how easy they are to learn and use, and how they *feel* under your fingertips when doing real work.

And from their overwhelmingly terrific response, it's

clear our users agree.

WriteNow 2.0 is the user's

WriteNow 2.0 is the user's choice for best Macintosh word processor—and we'll show anyone our customer registration cards to prove it!

What's new with WriteNow 2.0? Over 50 New Features And Improvements!

Mall Merge - 100,000-Word Dictionary - Character and Word Count Direct Opening and Saving of Text, MacWrite, and RTF (Word Option) Cursor Key Support - Windows Menu - Decimal Tabs Case Change - Hide Pictures Option - "Smart Quotes" Fixed Line Spacing - MultiFinder/Network Compatibility - and More! Write Now

T/Maker Company

T/Maker Company 1390 Villa Drive Mountain View, CA 94041 (415) 962-0195 Reterritory Witte Bour 2 Peter Programme Made

© 1988 T/Maker Company. All rights reserved. WriteNow is a trademark licensed to T/Maker Co.

New for the Mac II — Protection and Convenience, On or Off Your Desk!

